THE ENGINEERING AND MINING JOURNAL.

WITH WHICH IS INCORPORATED

THE COAL AND IRON RECORD.

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THE ENGINEERING AND MINING JOURNAL

Is devoted to MINING, METALLURGY, GAS MAKING and ENGINEERING.

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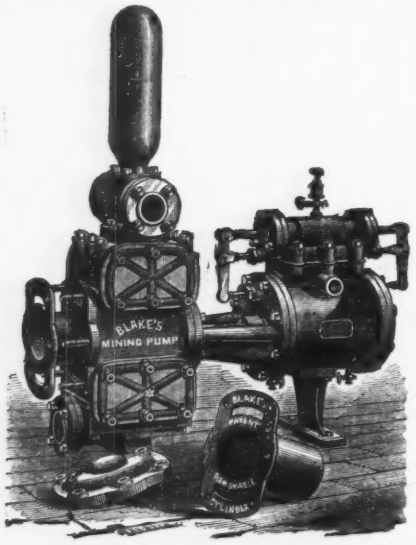

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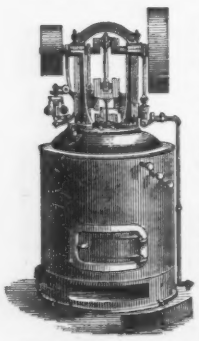

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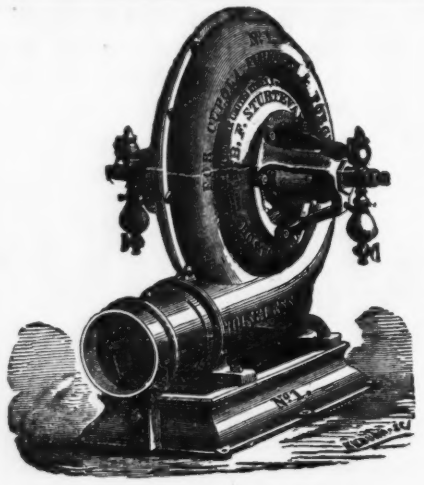

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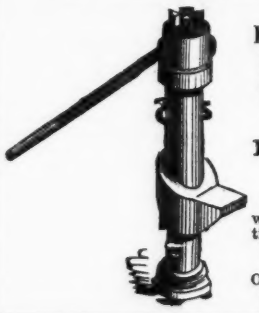

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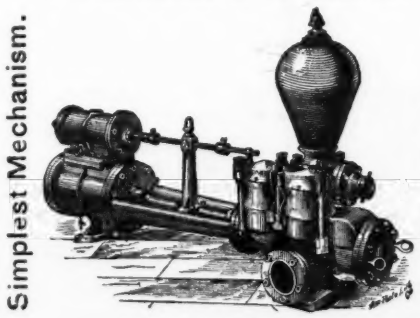

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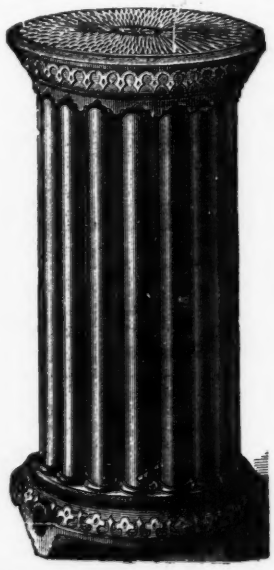

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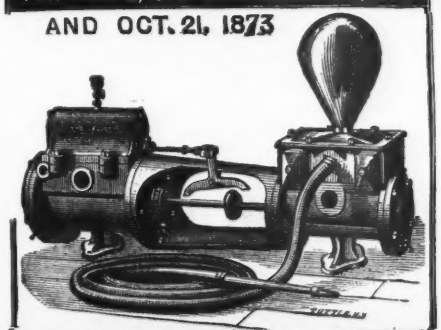

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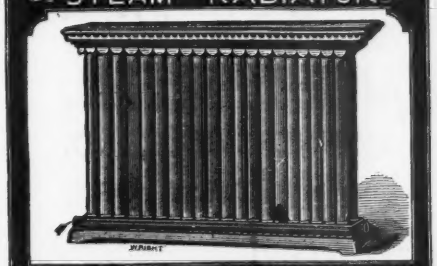

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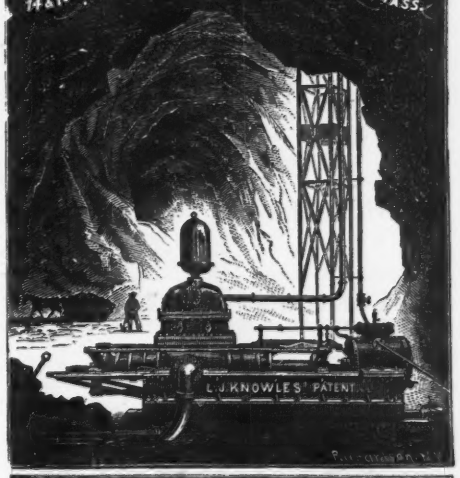

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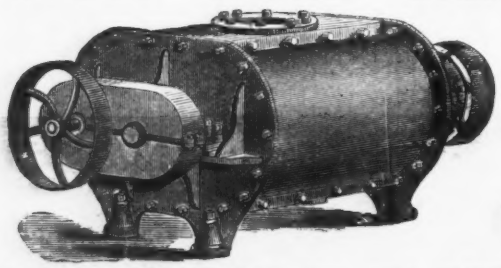

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Without decreasing size of any part of our "Engineers' Transit" we have reduced the weight one-half. An ordinary Transit Telescope magnifies from 10 to 12 diameters, our new Transit Telescope (length 10½ inches, shows objects erect and not inverted) magnifies 28 diameters and will read time on a watch-dial at 983 feet. For description of our new Mining Transit (weight 5¼ lbs.) and Plummet Lamp, see Van Nostrand's Engineering Magazine, June, 1873.

Extract from report of Committee of Civ. Engs. appointed by Franklin Inst. to examine H. & B.'s new Transit [Dec. 1871]: "It exhibits several novelties of construction which, in the opinion of the committee, render it superior to those now in use, and in its opinion the deviations which they have made from the common styles of Transit are decided improvements."

JOHN C. TRAUT FUX, Chairman.

Descriptive and Illustrated Price List sent Post-paid, on Application.

THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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The Amende Honorable.

THE *Bulletin of the American Iron and Steel Association* gives a perfectly satisfactory explanation of the curious coincidence in language between an editorial article in this paper and one which subsequently appeared in its own columns. It says the passage in question was found in the Pittsburgh *Commercial*, and inserted in the *Bulletin* "as an item of news merely;" and adds, "we supposed the item to be original with the *Commercial*, and therefore did not credit it, as there are no thin-skinned editorial pomposities employed on that paper." This is a queer reason for not giving credit for articles copied. It seems like an assertion that if an author is "thin-skinned" and "pompous," it isn't wise to steal from him, but if he isn't likely to resent the wrong, then he has no rights which *Bulletins* are bound to respect. But we will leave our friends of the *Commercial*, whom it more immediately concerns, to ponder the problem, and decide whether they hadn't better assume, as a matter of policy, those qualities which are thus declared to be the best protection against piracy.

The paragraph which the *Bulletin* took from the *Commercial* without giving credit, for the queer reason above given, had reference to the subject of gas; and the *Bulletin*, with neat but cruel wit, calls it in consequence a "gassy" item. The hit is excellent—and, being repeated several times, will certainly impress itself on every reader, which mere wit, without judicious repetition, often fails to do. And the magnanimity of the following sentence even surpasses its humor—which is saying a great deal:

"Hereafter, whenever we see a gassy item on a gaseous or gassy subject in any of our cotemporaries, we will at once conclude that it had its origin as a leading editorial in the ENGINEERING AND MINING JOURNAL, and if we use it to help our foreman in making up the pages of the *Bulletin*, we will give credit accordingly."

This is one of those ardent impulses of repentance which need to be restrained. Let us kindly point out to our neighbor that in the generous zeal of a late contrition towards us, it is in danger of wronging others. Restitution, after all, does not consist in returning to the wronged person property of which he has never been deprived. The *Bulletin* need not pay its debts to this paper by forced contributions levied upon other papers. Far less than that will be quite satisfactory. Let it simply bear in mind that an editorial expression of opinion is not "news," unless the source of it is indicated. Putting it in the columns of the *Bulletin*, unauthenticated, deprives it of interest and weight. And secondly, as a gentle hint to a beginner in the art of apology, we venture to remark that even such an exuberant confession and promise of reformation as the *Bulletin* has made is marred, if an attempt to belittle the value of the article appropriated accompanies the acknowledgment of the error. The unsophisticated reader will be likely to ask: Does the *Bulletin* select articles from other papers because they are "gassy" and worthless? And by what law of affinity does it omit to indicate the source of such articles, while "there are few journals anywhere, if any, in which credit is so uniformly given for selected matter?"

After its exhausting effort at magnanimity, the *Bulletin* is of course excusable for relapsing into direct attack. The reaction is natural, and we shall reply with entire good nature to what might seem, from another quarter and under other circumstances, an unwarrantably personal attack.

1. The *Bulletin* gives in parallel columns two items, one editorial, from its own pages, and the other an abridgement of the same, printed in solid (not leaded) type upon a news (not an editorial) page of this paper, as an "item," not an editorial. The omission to give credit to the *Bulletin* as its source was certainly unintentional. The item was interesting and important, and the *Bulletin* was entitled to an acknowledgment for the enterprise and ability shown in this, as in so many other matters. It is true, the type clearly indicated that it was an extract, and not original with us; but that does not excuse us. It is also true that we may have found it in the Pittsburgh *Commercial*, whose editorial staff contains no thin-skinned pomposities; but we think it would be very shabby indeed to plead *that* as a justification. The slight changes made in the item were simply abbreviations, such as we are obliged to make in selected matter, besides printing it more compactly, in order to leave room for editorials and original contributions. We are heartily sorry if they in any way detracted from the clearness or accuracy of the paragraph, which was really one of the most useful that have appeared in that useful paper, the *Bulletin*.

[Now, *that's* the way to make an apology!]

2. The *Bulletin* quotes from an article by Mr. RAYMOND, (May 1st) which it calls "characteristically vulgar," a statement that it began a good while ago to advise ironmasters not to patronize this paper; and this statement it declares to have been "conspicuously inexact," and known at the time to both the editors of the ENGINEERING AND MINING JOURNAL to be "totally destitute of truth," and inspired and circulated by recklessness as a necessary excuse for bad breeding. The *Bulletin* says "it never gave such advice, though doubtless the Free Traders in this office are ready to admit that their misrepresentation and abuse of American ironmasters would long ago have justified it."

What the "Free Traders" in this office would admit, we have no means of knowing, since there are none here, and never have been any. We have taken pains to define our position repeatedly, and in our opposition to last year's *increase* of the tariff on iron, we were supported by many leading ironmasters. We thought it would not benefit the trade, and it has not done so; we thought it would weaken the claims of the iron manufacture to even legitimate and necessary protection, and it has done so. The demand from any industry of an unnecessary favor is a suicidal policy, tending to produce a reaction. The iron trade, especially, should have learned to let well enough alone. We thought improvements in the manufacture, the cheapening of the cost of production, and the retirement of badly situated or badly managed establishments from the business, would slowly bring about the only possible cure of the prostration of the iron trade. And we condemned the clique of political ironmasters whose outcry for more tariff and more irredeemable currency seemed to us both silly and dangerous. We have seen no reason to change these views, and, when occasion calls for it, will urge them with all the more force because events have proved their entire correctness.

The *Bulletin* set out to brand us as Free Traders, insisting upon a difference of opinion concerning the amount and importance of the tariff as tantamount to a thoroughly hostile position. It was scarcely wise to take so much pains to change the issue, and fix upon a moderate ally the reputation of an enemy. But, wise or not, it was not successful. The *Bulletin* published, in August, 1874, a list of the journals representing the iron trade, remarking that they were all consistent advocates of protection, and recommending them to the patronage of ironmasters. From this list, the name of THE ENGINEERING AND MINING JOURNAL was "conspicuously" omitted. The article was evidently intended for us, and was so understood by the readers of the *Bulletin*, and this was not denied by the *Bulletin* at the time when its attention was called to the subject. This was probably the origin of Mr. RAYMOND's statement. If it had been challenged at the time it was made, it might have been verified by more numerous and exact citations. At present, writing without the advantage of a file of the *Bulletin*, we can only assure our cotemporary that we intended to do it no injustice, and that we still retain our opinion as to its attitude and course regarding us.

3. We beg to point out to the *Bulletin*, as worthy of its notice, that we have never indulged in any offensive personal remarks concerning its editor or any of its patrons. We have criticized freely published articles, published speeches, published circulars, and, in one or two instances, messages openly sent to the editors or publishers of this paper. But we do not charge anybody with "characteristic vulgarity," or "base insinuations," or lack of personal honor. Nor shall we waste our columns in replying to such charges. We trust they have not destroyed our reputation; and we are quite sure they do not deprive us of our good nature. *

A New Lighting and Heating Gas.

THE LOWE PROCESS.

THERE are few metallurgical questions more important than the economical gasification of coal, and the cheap manufacture of a good lighting gas, though not identical with the metallurgical question, is yet so closely allied to it, that when we find the one we shall probably be near the solution of the other. The use of naphtha and petroleum in the manufacture of lighting gas has not, hitherto, been very successful, the chief objections being a practical difficulty to thoroughly mix, or rather to keep mixed, the gases; they "stratify," and thus at one moment give a brilliant flame, while at the next the light is greatly reduced. There is also a condensation of the carbon, by which the illuminating power of the gas is greatly reduced and the pipes obstructed. These and other less important difficulties have, thus far, made our naphtha processes practical failures, though many of them gave remarkably satisfactory test trials. That some solution for these difficulties will eventually be found can scarcely be doubted, and, indeed, it would appear as if a practical success has already been attained in the process invented by Mr. T. S. C. LOWE, of Norristown, Pa.

Mr. LOWE's process consists in producing, from anthracite and the decomposition of steam, a gas of very high heating power, and then enriching this by means of crude petroleum when the gas is to be used for illuminating purposes. The anthracite is charged in a small cupola of, say, 3½ feet diameter, the bed of coal being kept from 3 to 4 feet deep. When fairly ignited, the base is closed, and superheated steam is admitted through tuyeres a short distance above the grate bars; the steam in contact with the burning coal is decomposed, and the gas produced is a mixture of hydrogen and carbonic oxide. The cost at which this excellent heating gas is produced is very small, indeed, and its application in metallurgical processes and for domestic use offers many

important advantages. Of course, it is in this state entirely unsuited to illuminating purposes. To enrich it, a small jet of crude petroleum is directed on to the surface of the burning coal; the gases are thus mixed in the nascent state, and, to still further ensure their thorough mixture at a high temperature, they are passed through a chamber formed of fire-brick, with small spaces between the bricks, heated in the manner of a Whitwell hot-blast stove; this ensures a thorough mixture at an exceedingly high temperature.

The charge which has been used in some of the works using this process has been about

280 gals. of crude petroleum
3600 lb. anthracite

for the production of 70,000 cubic feet of illuminating gas; the total cost amounting to 56 to 60 cents per 1000 feet.

This promising improvement in gas making has passed the stage of mere experiment, and appears to have entered that of practical success. Warned by the fate of several naphtha and petroleum processes brought out with many promises and small performance, the inventor of this process and his friends determined to thoroughly test this invention on a practical scale before giving it publicity. They erected their first gas works at Phœnixville, Pa., a place of some 10,000 inhabitants, and have since put it in operation at several small towns. It is, we understand, successfully working at each of these places, at Phœnixville having now, for eighteen months, lighted the town to the general satisfaction. The cold of the past two winters has affected this gas no more than, if as much as, ordinary coal gas, and, consequently, the "fixedness" of this product appears to be fully established.

To demonstrate the adaptability of the system to the lighting of large cities, works were established by arrangement with the Utica Gas-light Company, and we are informed that, for the past three months, the city of Utica has been lighted exclusively with gas made by this process; and we understand the Gas-light Company is so well satisfied with the results, that it proposes to adopt it permanently. Not the least item of saving effected by this process is in labor. But two men—who are common laborers—are employed at the Utica works, and their time is but partially occupied; the addition of one more would suffice for a production of four times the present supply. The cost of the gas in the holder is claimed to be not over one-half that by the old method, while the quality of the light is very satisfactory.

We shall give further particulars of this important improvement in gas making on another occasion. The facts reported are of the greatest interest and value. And while the success of this method of producing an illuminating gas appears to be fully established, we look upon its application to the production of a heating gas as of even greater importance.

The day is not far distant, let us hope, when we shall use gas instead of coal for the heating of our houses and for cooking. That this will effect an enormous saving in the use of coal, and will be infinitely cleaner, pleasanter, more satisfactory and economical, cannot be doubted. We, therefore, welcome any practical device that brings us nearer to this most desirable solution of the "fuel question."

CORRESPONDENCE.

Coal River Railroad Company of West Virginia.

[WE have received the following letter from Mr. THOS. L. BROUN, President of the Coal River Railroad Co. While we publish Mr. BROUN's explanation of the "real nature of this enterprise," we think it almost unnecessary, for the extracts made in our former article gave a true and fair idea of the enterprise; nor can we see that we have in any way done injustice to this ingenious prospectus.

That sixty million bushels of coal go down the Ohio annually, is no reason why this prospectus should state "the demand for Coal River Coal is now sixty million bushels per annum;" while, in fact, the total output of the entire Kanawha region was last year but about 11,000,000 bushels. The mere fact of being 250 miles nearer Cincinnati than is Pittsburgh is not, in itself, so important an item as is represented in the prospectus. Coal was last year carried from Pittsburgh to New Orleans at a net cost, including the full round trip of the boats, of 1-64th of one cent per ton per mile!* But even at 1-10th of a cent, the difference against Pittsburgh would be but 25 cents per ton, while it costs more to mine coal on the Kanawha than on the Youghiogheny by more than 25 cents a ton, and the charges on the Coal River Railroad alone would doubtless be not less than 30 cents per ton.

We note the admission that, to get the black-band iron ore and cannel coal, on which the company counts for a part of its profits, a road of twenty miles in the first case and of twenty-five miles in the second, must be built, so that those who build sixteen miles will either have to furnish the additional capital to get at the profitable coal, etc., or sink their first investment.

We are also told that 50,000 acres of coal land, within 25 miles of Coalsmouth, *can be* purchased at $10 per acre. We do not question this, but are *the* 50,000 acres purchased, or rather contracted for, by the Coal River R.R. Co., within 25 miles, by rail, of Coalsmouth, and if so, what does the reference to the map mean, when we there find the main body of these lands 40 or 50 miles from that point?

Mr. BROUN is not fortunate in his explanation why the coal mines do not pay which are situated, say, 20 miles above Coalsmouth, on the Kanawha—which is a good navigable stream, as high up as Coalburg, during a great part of the year—*and which already have at their service a railroad*, that would carry their coal to deeper water, if necessary, while the mines to be opened 20 miles up Coal River, he says, will pay. Why does he not explain why the Peytona mines on Coal River, in the very center of the district in which this company proposes purchasing, and which already has a slack-water navigation to Coalsmouth, has not succeeded in earning dividends?

In a word, we see no reason to change our opinion of this enterprise as now proposed, except, possibly, to adopt the correction suggested as to its relative value to investors and promoters. They may be more nearly alike than we thought, and each will probably draw blanks.]

TO THE EDITOR—SIR: In your paper of July 3rd, there is an article criticising a prospectus issued by the Coal River Railroad Company. A fair and impartial criticism on any public enterprise is beneficial to all interested therein, but the article referred to fails to present the real nature of this enterprise.

As the development of the Great Kanawha coal field is a question in which many of your readers are largely interested, we, therefore, ask that you will publish the following reply to your criticism:

The Coal River Railroad prospectus states that sixty million bushels of coal are annually sent down the Ohio river, *by the mouth of the Great Kanawha*, to Cincinnati, Louisville, New Orleans, and other cities on the Ohio and Mississippi rivers; that this supply of coal is sent chiefly from the Monongahela and Youghiogheny mines in Pennsylvania, which are 250 miles farther from Cincinnati than is the Great Kanawha coal field; that the coal lands on the Great Kanawha *proper*, and its four chief tributaries—Coal River, Elk River, Gauley River, and New River—constitute the five grand divisions of the Great Kanawha coal field; and that the Coal River coal lands are nearer to Cincinnati and the Western markets, than are the coal lands of any other grand division of the Great Kanawha coal field.

2. The prospectus further states that Coal River coal lands can be reached by a railroad 15 miles in length, from the Kanawha River at Coalsmouth; that Coal River land-owners obtained, in 1872, a most valuable charter from the Legislature of West Virginia; that the Coal River Railroad Company has been organized; and that the Company has purchased and contracted for 50,000 acres of the best coal land on Coal River, at $10 per acre, payable chiefly in its 7 per cent. bonds, running 10 and 20 years, interest payable annually, and each owner retaining a lien on his land, or on a moiety thereof, as security for the payment of the purchase money.

3. The prospectus further states that the Company is now offering these 50,000 acres of land for sale, *with the charter as a bonus*, to parties who will build and equip 16 miles of narrow gauge railroad, and meet the payments on the 50,000 acres of land purchased and contracted for as aforesaid.

Such are the chief features of the Coal River Railroad enterprise.

Furthermore, during the past 20 years, various efforts have been made by mining companies in different parts of the Great Kanawha coal field, to mine and ship coal, *with profit*, and to supply, in part, the Western demand for coal. But, so far, these efforts have generally proven a failure. And why? Chiefly for two reasons:

1. Because the Upper Kanawha coal lands constitute the main body of the most valuable coal lands on the Great Kanawha *proper*, and are situated at Cannelton, Paint Creek, Coalburgh, Lewiston, and other localities found 25 to 40 miles above Coalsmouth.

2. *Because the navigation from the Upper Kanawha coal lands is not as good and reliable for shipping coal, as the navigation of the Upper Ohio is from Pittsburgh.*

The Coal River Prospectus, however, claims that with 16 miles of narrow gauge railroad, constructed and equipped, this Western demand for sixty million bushels of coal per annum can be supplied from Coal River. And why? *Because the Kanawha navigation from Coalsmouth down is as good and reliable as the Upper Ohio navigation is from Pittsburgh.*

To compete successfully with the Pittsburgh coal shippers, a very strong company must be formed. One that must own both the coal lands and the railroad, and that will be able to place in Cincinnati and the Western markets at least twenty million bushels of coal per annum. This is the kind of coal company the Coal River land-owners, with their charter, are endeavoring to put into operation.

We will now briefly notice some of the minor points criticised.

The 5 per cent. commission ($30,000) in bonds offered to the Promoter, and his *pro rata* share of the capital stock, are the usual commissions allowed for such services.

The $30,000 and the $600,000 of bonds are part of the $1,000,000 directed to be issued by the company.

As the investors will hold $600,000, and the promoter $30,000, in bonds, it is difficult to see how the investors will have blanks and the promoter a prize!

The map itself shows that the rail route is shorter, by several miles, than the river route to the coal lands.

Payment of annual interest on the bonds for lands purchased constitutes "*payments on land contracts.*"

The land owners have subscribed $51,600 to the capital stock for the purpose of organizing the company and keeping alive the charter, and they will receive no additional subscriptions to the capital stock, except from parties who are able to purchase and pay for 50,000 acres of Coal River coal land, and to construct and equip 16 miles of narrow gauge railroad.

As to the price, character and locality of the Coal River coal lands, we will add that several workable veins of excellent splint bituminous coal on Coal River can be reached by a railroad 15 miles in length from Coalsmouth. That a workable vein of black band iron ore is within 20 miles, and a workable vein of good cannel coal is within 25 miles of Coalsmouth, and that 50,000 acres of Coal River coal land, well timbered, and within 25 miles of Coalsmouth, can be purchased at prices not exceeding $10 per acre, whilst further up Coal River some lands can be purchased at lower prices.

In conclusion we will say that *it is the ownership of coal lands and railroads conjointly that constitutes the most successful and powerful coal organizations in the United States, and this is the basis of the Coal River railroad enterprise.*

CHARLESTON, West Va., July 14, 1875. THOS. L. BROUN.

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* Remarks before American Society of Civil Engineers, by Mr. SHINN, Superintendent, Allegheny Valley Railroad.

Coal for the Centennial.—A column of coal from Mr. C. J. Campbell's mine, New Campbellton, C. B., for the Philadelphia exhibition, has arrived in town.—*Halifax Chronicle.*

New Breaker.—The Park Hill Coal Company are about to erect a splendid coal breaker on their property on the Hyde Park side of the Lackawanna. The new structure will have a large capacity, and be built on the most approved design.

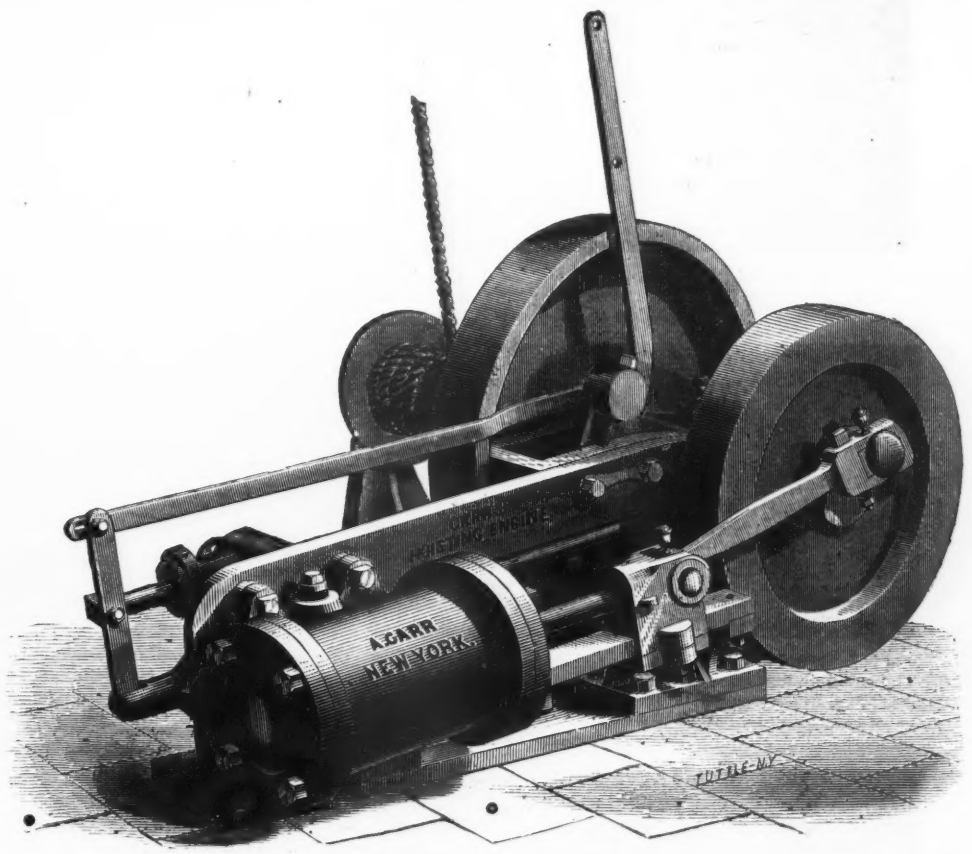
Carr's Hoisting Engine.

MR. A. CARR, of this city, has long been well-known for the excellence of his "Selden Pump," and other machinery, no less than for the promptness and energy with which he conducts his busines. We have noted on several occasions his shipments of machinery to foreign ports; his pumps have been successfully introduced in the coal mines of Saxony, and he has recently shipped twenty-two steam radiators to Belgium. It is to such men we look for the development of American industry, and it is gratifying to be able to record a substantial success in this instance.

Besides being a live business man, Mr. CARR is an ingenious mechanic, as is well shown in the design of the small hoisting engine which we now illustrate. We have here the engine and drum combined in the most compact form, and yet every part readily accessible. The drum and the large friction wheel, in one piece, run free on a shaft which at one end is hung in an eccentric, worked by the lever arm, which stands vertical in the cut; by the movement of this lever, the large friction wheel is brought on its inner surface in contact with the small V friction wheel on the engine shaft, and from the enormous leverage obtained, not only can the full force of the engine be transmitted, but it is necessary to put a "stop" on the lever to prevent such an excess of pressure and friction in the bearing as would even absorb the full power of the engine.

The inside gearing offers several advantages which are here well secured. One of the most ingenious devices in this engine is the connection of the steam valve with the lever working the friction and brake, so that when the friction is applied, the steam is admitted to the cylinders, and when the lever is moved in the opposite direction, not only is the friction thrown out of gear, but the steam is shut off and the brake is applied. This simple and ingenious contrivance effects a great saving of steam, and it secures the most perfect control of the engine. At the same time, a small quantity of steam is admitted independent of the valve movement, and will prevent the engine standing on the dead point.

Though the engine we illustrate is quite small, having been built for hoisting on a steamer, yet its simplicity and success have induced MR. CARR to build large hoisting engines on the same plan, and indeed, it would be difficult to find a better example of simplicity and ingenuity in design.



CARR'S HOISTING ENGINE.

The Relative Economy of Automatic and Fixed Cut-off Engines.

Written for the ENGINEERING AND MINING JOURNAL, by JOHN W. HILL, M. E.

ALTHOUGH steam users generally are agreed upon the superior economy of the automatic cut-off engine, few, excepting those who have had the opportunity of making a practical comparison, are aware of the great saving in the expense of fuel over that class of engines wherein the point of cut-off is invariable relative to stroke of piston. It is quite well understood that the amount of work realized, as compared with the total theoretical work due the volume of steam expended, even in the most perfect engines, is a very small percentage of the whole energy, and it is, therefore, the more an object of interest to know precisely what the difference is between these two classes of engines in point of economy.

It may appear singular that any intelligent engine builder should deny the superiority of the cut-off engine; yet, there are of the writer's acquaintance those who strenuously maintain that the excellent economy lies in the representations rather than the performance.

Several months ago, the writer was called (in an official capacity) to conduct a series of comparative experiments upon two of the more prominent automatic engines built in this country. The data were very carefully collected, and the results worked up with more than ordinary precision. The economy of both was excellent, as compared with the results of previous experiments upon the same engines.*

In order to determine the real merits of this class of engine as compared with those in general use in this country, further experiments were made upon the better patterns of double slide valve engines arranged to cut off at a fixed point in the stroke, with the results as shown by the diagrams 4 and 5, and columns 4 and 5 of the table.

During the preparation of that part of the paper relating to diagrams 4 and 5, the diagram marked 3 was sent to the writer, by a person interested in the automatic engine, with the instructions that it be worked up, and the results compared with those obtained from the Corliss and Babcock & Wilcox engines. It is included in this paper, to show that the mere fact of the periods of cut-off being invariable, and regulated by the governor, is, of itself, not a sufficient guarantee of a superior grade of economy in the performance of the engine.

In the construction of a machine, it is not enough that all the essential elements are therein introduced, but their functions, independent and combined, must be carefully studied; and the aggregation of elements must be such as to yield results equal or superior to the standard of its class, else it fails to command the respect of scientific men, since its effect is to diminish, rather than extend, the public confidence in scientific development.

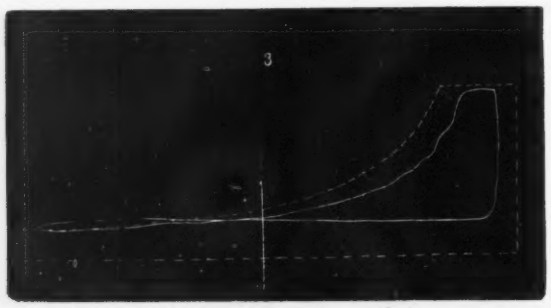
The publishing of the regular monthly duty reports of the Cornish pumping engines had, in all probability, as much to do with the steady improvement in their duty, as all the learned discussions before the Institution of Engineers. It was an incentive to every manager of an engine to at least equal the economy of the foremost competitor, and resulted in placing the relative efficiency of these engines before any other in the world.

Of the accompanying diagrams, (1) is from a Corliss Engine, running 60 revolutions per minute; the cylinder and steam-chest were coated with asbestos cement, and lagged with walnut staves; the cylinder heads were depressed inside the flange, and the space filled with cement; the rear cylinder head valve-boxes and bonnets were exposed, and highly polished.

Diagram 2 is from a Babcock & Wilcox Engine, running 84 revolutions per minute. The cylinder of this engine was jacketed with live steam, and coated with asbestos cement, under a lagging of walnut; the cylinder heads were hollow, and the void filled with live steam; the top and side of steam-chest were laid with cement, and finished with wood; the rear cylinder head and ends of steam-chest were exposed and polished.

* Report of Board of Commissioners, Cincinnati Industrial Exposition, 1874.

Diagram 3 is from the cut-off engine that furnished the power for the machinery at the last Fair of the American Institute, New York. This card was taken at a speed of 53 revolutions per minute. The cylinder of this engine was clothed in a non-conductor, under a lagging of wood; the valve boxes and



cylinder heads were exposed and polished; the admission at cut-off of steam is effected by a pair of spindle valves, the lift of which is controlled by the regulator; the exhaust is effected by a pair of slide valves under the cylinder.

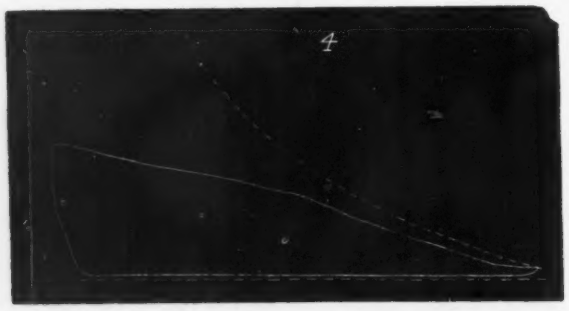


Diagram 4 is from a double slide valve engine, arranged to cut off at half-stroke. The engine ran 72 revolutions per minute. The cylinder was lagged with poplar staves, under a jacket of Russia iron, banded with strips of brass; the steam-chest and cylinder heads were exposed and polished; the engine was very closely connected with the boiler, with but two turns in the steam pipe.

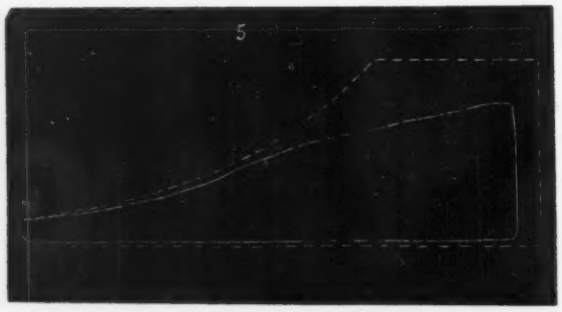


Diagram 5 is from the same class of engine, running 57 revolutions per minute. The cylinder was lagged with ash staves, oiled and polished; the cylinder heads and lid of steam-chest were highly polished. This engine was quite new, and had been built to develop 75 horse-power, at a pressure of 60 pounds (above the atmosphere) in the pipe.

The owners of the engine, after a trial of several months, were of the opinion that it did not fully accord with the builders' guarantee; in addition to this, it "pounded" severely. After several ineffectual attempts upon the part of the builders to make the engine acceptable to the owners, the writer was called upon to make an examination and indicate the engine. With a pressure of 46 pounds in the pipe, and all the load the engine would carry at the mean speed, the indicated horse-power was 30.88, and the pressure in the pipe, to develop 75 horse-power, would have been nearly 112 pounds (above the atmosphere).

The diagram exhibits a total lack of cushion. Presuming this to be the cause of the "pounding," a new valve (designed by the writer) was put into the engine, the adjustments made with the indicator, and the distress entirely disappeared.

In the following table the columns are arranged according to the diagrams:

General Dimensions of Engines.	1	2	3	4	5
Diameter of cylinder.....inches	16.06	16.00	20.00	16.00	16.12
Length of stroke..... "	48.00	30.00	40.00	24 00	31.25
Revolutions.....	60.108	84.308	53.000	72.000	57.300
Piston speed .....feet	480.86	421.54	353.30	288.00	298.44
Cut-off in parts of stroke	.1512	.2622	.0947	.5564	.3200
H. P. due area and velocity of piston...	2.9527	2.5683	3.3603	1.7546	1.8456
Computed Dimensions.					
Piston displacement per hour, reckoned to point of release	40254.	33585.	43694.	24006.	25393.
Piston displacement per hour, from exhaust closure.....	1775.25	5575.45	3093.28	1900.73	
Cubical volume of clearance, per hour..	1174.16	1578.19	1848.20	1158.11	1139.85
Specific gravity of steam at terminal pressure	.000626	.000869	.000505	.000662	.000738
Specific gravity of steam at counter pressure.....	.000599	000.599	.000599	.000617	.000625

	1	2	3	4	5
By the Diagrams.					
Initial pressure.....above atm.	71.25	68.90	53.50	19.75	37.75
Terminal " ..... " "	1.25	8.00	—2.50	2.00	6.00
Counter " ..... " "	.50	.50	.50	.75	1.25
Mean effective pressure.....	23.44	29.45	10.79	8.75	20.13
Indicated Horse power	69.21	75.66	36.26	15.35	30.88
Cost of the Power.					
Water per hour, per indicated horse power.....lb.	24.24	24.69*	38.34	66.81	46.35
Coal, per hour, per indicated horse power, upon an assumed evaporation of 9 lb. water per 1 lb. coal.... "	2.69	2.74	4.26	7.42	5.15

* 2¼ per cent. added for loss in jacket and auxiliary cylinder.

Diagrams 1, 2 and 3 are from cut-off engines.
Diagrams 4 and 5 are from throttling engines.

DIAGRAM I.

This is a very perfect card, and exhibits the careful adjustments of the valve motion.

The Corliss valve gear possesses an advantage peculiarly its own—that is, any correction in the valve motion may be made whilst the engine is in motion; the proper time to make any corrections, shown by the indicator to be necessary, is with all parts thoroughly warmed up to the working temperature. The leading objection to this engine, in its present construction, is the extreme difficulty experienced in making the requisite close fits in the valve joints; the peculiar shape of the valve (cylindrical) prevents the use of the scraper, if protuberances (which it is nearly impossible to completely eliminate in the castings) are found upon the surface of the valve face or chamber; hence a certain leakage through the port, after cut-off has taken place, may almost invariably be detected in diagrams from this engine. Another objection is the setting of the steam valves within the port, *i. e.* between the induction pipe and the steam port. This arrangement compels the steam to flow through a contracted orifice over the back of the valve, and causes it to change its angular direction five times, when, if the valve was set without the port, but one change of angular direction would occur between the steam-chest and the cylinder; and no impediment would exist to the free flow of steam from the pipe through the chest into the port at the opening of the valve. The position of the exhaust valve is excellent, furnishing, when open, an unobstructed passage for release.

Another objection which has shown itself to be worthy of consideration is the arrangement of the exhaust chamber. This, like the chest, is separated from the bore of cylinder only by the shell; and since the exhaust steam in these engines (non-condensing) has a temperature from 50° to 60° Fah. less than that due the mean pressure, it is evident that a serious loss in the temperature of the metal of the cylinder and the expanding steam during the latter portion of the stroke must occur for every semi-revolution of the crank. It is not necessary to state this loss in foot pounds; for certain conditions of initial pressure of steam, cut-off, etc., it is enough to point out that it occurs. Whatever it may be, it is readily avoided by dropping the exhaust passage sufficiently below the cylinder to interpose a lagging of wood over a coating of cement, or an air jacket, between the current of exhaust steam and the shell of the cylinder.

TO BE CONTINUED.

The Coal Fields of China.

WANG CHING YONG is the name of an Imperial Commissioner, deputed by the Chinese Government to visit our collieries, mines, iron works and engineering establishments, with the view of shortly returning to his own country and utilizing the extensive coal fields there. As the importance and vast extent of the Chinese carboniferous deposits may not be generally known, a word or two on the subject may not be out of season. From sundry authorities we learn that the estimated coal areas in various provinces are as follows:

	Square miles.		Square miles.
Chih-li, Shantung and Southern Manchuria	84,000	Yu-nan	20,000
Sz-chuen	70,000	Kwei-Chow	14,000
Kiang-si	35,000	Kwang-si	13,000
Shan-si	30,000	Ho-Nan	10,000
Fur-kien	25,000	Coeh-Kiang	6,000
Shen-si	25,000	Hupeh	5,000
Kwang-tung	23,000	Ngan-Whui	4,000
Hunan	21,000	Kiang-Su	4,000
Kiang-su	20 000	Total	409,000

Prof. ANSTED'S estimate of the coal fields of Europe is:

	Square miles.		Square miles.
British Islands	12,000	Prussia	1,200
France	2,000	Bohemia	1,000
Belgium	520		
Spain	4,000	Total	20,720

Thus we see that in the two provinces of Sz-chuen and Yu-nan, which are the districts the proposed railway through Burmah to the Irrawadi would more immediately benefit, the estimated coal deposits amount to 90,000 square miles—more than four times more than the whole Carboniferous area of Europe, or seven and one-half times larger than the coal fields of Great Britain, of which we are so justly proud as having contributed so materially to our national wealth. For centuries, surface coal has been worked in many parts of China, but in consequence of the inability of the natives to cope with the continual influx of water, their workings have rarely been prosecuted to any depth; consequently, no matter how rich the seam, it had usually to be abandoned long ere the best coal had been reached. In the mountainous districts, such as the upper part of the Yang-tsze-Kiang, at the gorge of Tatanpa, coal mining is conducted by means of horizontal workings or tunnels driven into the sides of the hills, sometimes at a great height above the normal surface of the river. From these openings the coal is frequently procured in the form of dross or dust, which is afterwards pounded along with loam and water and packed into bricks, like our patent fuel. For the convenience of shipment, strong plaited bamboo hawsers are stretched in pairs from near the orifices of the galleries to jetties on the river, where they are kept taut by powerful windlasses. On these enormous ropes, sometimes many hundreds of yards in length, stout baskets traverse, so that a full one descending pulls up its empty predecessor on the twin cable, the velocity being regulated by a brake on the grooved wheel

above, on which a smaller line runs. Uncouth and primitive as such a system of transport may appear to be, it possesses advantages in speed and cheapness for short distances which have already been imitated, with wire ropes, in different parts of this country. But, as a whole, the appliances and skill at present available in China are quite inadequate to do justice to such vast coal fields, so it is scarcely surprising that the Government is at length waking up to a sense of its own mineral wealth, and has been fired with the ambition of realizing it. The Commissioner has accordingly already inspected many collieries, especially some where the struggle between engineering ability and copious water is keenest, and it is to be hoped that the powers vested in him, by his Government, to purchase machinery and engage corresponding ability to erect and work it, may equal the experience he is now gaining. We understand he has gone to Paris and that he will take Essen on his return, in order to inspect Krupp's workshops.—*London Mining Journal.*

A New Mica Mine.

THE Salt Lake *Tribune* reports a rich mine of mica just discovered close by that city: "The mines are situated in North Mill Creek Cañon, about five miles from the line of the Utah Central Railroad. The belt is about 1000 feet in width and 1000 feet in length, lying in a granite foundation, through which the mica is distributed in large quantities. Sheets have been obtained 3 by 4 inches, and abundance of the article can be obtained of that size. A new graded railroad runs from the railroad to the mines. The stream carries water sufficient to run forty stamps. Wood is to be found in inexhaustible quantities within one or two miles from the mines. The fortunate owners are JEROME CROSS, DOC. SMITH and the GRAY boys."

[Then follows the usual estimate of "thousands of tons," "incredible amounts," and fabulous profits, that accompany all new discoveries. It is, of course, needless to add that a large discount on these estimates will be made for "instant belief."—ED. E. & M. J.]

The Comstock Lode in 1874.

From the forthcoming Report of the United States Commissioner of Mining Statistics.

CONTINUED FROM PAGE 76.

III. The southern portion of the Comstock, from the Imperial southward.

Yellow Jacket has attained a depth of 1840 feet. The vein shows in depth a flatter dip east than above; and, in consequence, the incline, following it, pitches 35° East from the 1600-foot level down, while above the 1600-foot level its pitch was 45°. During the past year, the 1740 and 1840-foot levels were opened. The 1300 and 1400-foot levels had developed a body of quartz which carried principally gold, but not in paying quantity. The 1540-foot level met the east clay 330 feet east from the incline. The vein was found nearly 300 feet wide, and was followed north and south to the boundaries of the claim. Crosscuts were run at every 200 feet, and the quartz of the 1300 and 1400-foot levels was found, but no ore of value. This level will soon (in a few days) be connected with the 1700-foot level of the Imperial for ventilation, and this will also enable the smaller mines between the Imperial and Yellow Jacket to prospect their ground at that depth. At the 1740-foot level, the vein was reached 220 feet east of the incline, and found to be 350 feet wide; but it carries less quartz than in the upper levels. The east wall is well-defined and dips 40° East. The vein was followed south to the Kentuck line, and north to within 300 feet of the north line, and found to be filled principally with porphyry. The north drift is still advancing and is now 440 feet north of the shaft. No cross-cuts have been run here. The 1840-foot level has advanced, to date, (April 1, 1875) 81 feet east from the incline, and 200 feet will have to be run to reach the vein. The mine produces at present no ore.

Kentuck.—At the 1540-foot level of the Yellow Jacket, a connection with Crownpoint was made through the Kentuck ground. The vein was strong and carried as much quartz as it did in Yellow Jacket, but no ore was found, except in small straggling seams. At the 1740-foot level the vein is being prospected, and it is probable that some ore will be found, since the middle ore-seam of the 1600-foot level of the Crownpoint extends north into the Kentuck. (See remarks on Crownpoint below.) The mine yielded a small quantity of ore from the 800 and 900-foot levels from the old workings, during the past year, and there is low-grade ore yet standing in the mine, which will some day be extracted.

Crownpoint.—This mine reached a depth of 1700 feet. The incline commences at the 1000-foot level, and sinks at an angle of 36° East. The old ore-body from the 500-foot level has been quite worked out, having ceased entirely at the depth of 980 feet. The newer body, which is now productive, and has paid all the late dividends in Belcher and Crownpoint, commenced at the 1000-foot level, extended at the 1100-foot level 275 feet north of the Belcher line; at the 1200-foot level, 300 feet north; at the 1300-foot level, 325 feet north; at the 1400-foot level, 325 feet north; and has been, up to April, 1875, worked for 350 feet north from Belcher line in the 1500-foot level. During the past year, the mine has produced from these levels 176,745 tons of ore, of an average mill-value of $65 per ton. The 1600-foot level has advanced 200 feet east and has reached the quartz of the upper level, and met with what seems to be another body of ore, which lies between the east and west ore-bodies of the above levels, only further north. (It is this body which may be expected to extend into the Kentuck ground.) The 1700-foot level has just been opened and the landing-station finished. No prospecting work has yet been done here.

In all these levels, from the 1000-foot level down, the general formation of the vein holds good for the Belcher also; and a concise general description of it, based upon Mr. LUCKHARDTS careful personal study, and applicable to both mines, may be of interest. The total width of the vein is not demonstrated. The west wall has a general N. and S. course, and stands, for 600 feet deep, wherever exposed, at, say, 50° E. The 1000-foot level showed a comparatively ore-barren quartz mass, (showing only small spots and seams of ore) 80 to 100 feet in width, which lay from 20 to 60 feet east from the west wall. In this quartz all the ore-bodies found above this level disappeared, pinching out into thin seams as they came down into it. It is bounded on the East by clay and porphyry; runs nearly parallel with the west wall; has been cut through by the incline about 80 feet above the 1500-foot level, where it seemed not to be so wide as above. This quartz-body carries little porphyry and only a very small percentage of carbonate of lime. It dips 48° East. No explorations have been made in it since the 1000-foot level cut through it. At the 1100-foot level the quartz-body, which has furnished all the ore for the past three years, was encountered 275 feet east of the shaft, being divided by porphyry and quartz from the western quartz. Once cut in the 1100-foot level, it was explored upwards and found to extend above the 1000-foot level. As depth was attained it widened; and instead of maintaining a distinct boundary to the East, it became more and more mixed with porphyry. Strange to say, neither the Belcher nor the Crownpoint Company has ever had the curiosity to explore the ground east of it at any point further than 65 feet. This quartz-mass varies in width from 90 to 250 feet, and carries, in places, large quantities of carbonate of lime, especially in its western portion. Explorations, so far, have proved that it contains two distinct bodies of ore, namely, an eastern body, which has no lime, and a western, which has a good deal. These two bodies unite at the 1500-foot level of Crownpoint, about 350 feet north of the Belcher line, and separate in the Belcher ground, so that about 400 feet south from the Crownpoint line, the distance between the two is 115 feet, filled with quartz and porphyry. The porphyry is identical with that which constituted the so-called east porphyry of the Comstock, at and above the 500-foot level.

The western body kept a steady dip of 45° East, had its widest place at the 1300-foot level, and carried the ore universally in seams, alternating with barren crystalline quartz and calcite. At the 1500-foot level, in Crownpoint, it had become too poor to work with profit. The eastern body continues deeper than the 1500-foot level, but lies now (at 80 feet below 1500 level) at an angle of 27° E., and its course is S. 20° E. It has carried its ores more evenly disseminated through the entire quartz-mass, and has been the stronger of the two bodies. Wherever the quartz widens, the silver diminishes. The southern portion of it, in Belcher, some 500 feet south of Crownpoint, gave, as assayed by Mr. LUCKHARDT, $45 in gold, and $8 in silver per ton. Now, these two bodies diverge southward and downward, at and below 1500 feet depth; and the material between them in the northern portion (where they are near together) is wholly quartz. In this has been found the third body above referred to, which may prove a large one, extending, as has been remarked, into Kentuck. The small ore-seams in the western body, and the general appearance of the ground, lead to the belief that this third body will be larger northward than southward. It is less likely that the porphyries, which show themselves in the gap southward, will give way to quartz. Moreover, this intermediate quartz to the North is, probably, the identical quartz-body which the 1100, 1300 and 1400-foot levels of the Yellow Jacket developed. The proportion of the gold and silver in it being the same, is additional proof. If these views are correct, it is highly probable that, within the year, a fine ore-body will be found between the centers of Yellow Jacket and Crownpoint in the quartz which shows itself at both points. The 1600-foot level of Crownpoint, about 365 feet south from the Kentuck line, has very recently encountered ore in the region referred to.

The two bodies already known were explored by 5 winzes, one being sunk where they join on the North, and two in each body further south. With the exception of considerable solid ground in the east body, the greater part of both has been worked out. The present yield per day is about 500 tons of $30 mill-ore, and there is still standing fully nine months' supply from the lowest points explored by the winzes below the 1500-foot level to the 1300 level, and north and south of the present stopes. The 1300-foot level showed the ore in the widest place 130 feet, and between the 1300 and 1400 are about 125 feet length of ore-ground standing, 40 feet high, averaging 40 feet in width. Below the 1300-foot level, 350 feet from the Belcher line, the two bodies come together, and at the Belcher line the space between the two is 88 feet and the west body is poor. At 35 feet north of the Belcher line is the south winze, now 49 feet deep in the west body. The west body has been exhausted at this point. At the 1400-foot level the south winze is 40 feet north of the Belcher line, and connects with the 1500-foot level; the middle winze is 135 feet north of the Belcher line, and the north winze 300 feet north of the Belcher line—all in the east body, and all showing the same quality of ore as above stated (average $35). At the 1400-foot level, the ore is 50 feet wide, and is known to extend from the north winze to the south winze—300 feet in length. The west body, 36 feet wide, is exhausted on this level. Stoping has been commenced 40 feet above the 1500-foot level north, where the west body gives out in ore—*i. e.*—stops short, without first decreasing gradually in its ore-contents. The west body has two winzes in it, between the 1400 and 1500-foot levels, which, however, proved but poor ore ($20 mill-ore). At 40 feet north of the Belcher line, in this level, a cross-drift east was run for 60 feet; but no east wall has been found; at 140 feet further north, another eastward cut was opened and continued 65 feet east beyond the ore, with the same result. Here the east body is 10 feet wide, dipping very flat eastward. Here the west quartz (away to the West of the west body) has never been explored. Further north, the 1500-foot

level had to pass 60 feet of quartz-width before it came to the west quartz-body. About 140 feet north of the Belcher line the east cross-cut shows, 60 feet east of the east body, some fine quartz-stringers; and it is surprising that no work further east was done here as it certainly ought to have been. There is no east wall visible. Below the 1500-foot level no ore has been extracted. The west body is, so far as explored, valueless, the ores being too poor to pay for working. The east body goes off very flat and shows signs of weakening. The future success of Crownpoint depends much on the explorations and their results now pending in the 1600, and also the work east in the 1500-foot level, which ought to be undertaken without fail. The incline bottom is now 367 feet south of the Kentuck line; it traverses the company's ground, commencing at the 1000-foot level at the Kentuck line. The cars used for hoisting ore and waste lift 7 tons, using round ropes of steel. The dead weight of the incline rope, which has to be overcome, is 17,000 lb.

The company has an extra incline-engine of 134 H. P., a splendid piece of work. The incline car has brakes attached, and all are made after the pattern of Mr. DONELLY, of whom I spoke last year, who now is in the Belcher, and showed his good sense there in all the contrivances and appliances for compressed air.

Belcher.—This mine has attained a depth of 1580 feet. The shaft is 850 feet vertically, whence begins the incline, 250 feet south of Crownpoint. The ore here in Belcher extended up to the 900-foot level, and a considerable quantity of $30 ore is still standing here between the 900 and the 1050-foot levels. Below 1050 feet, all the ground has been excavated for 300 feet south from Crownpoint, and for 60 to 300 feet in width (horizontally) down to the 1300-foot level. Some low grade ore is standing south of the stopes; but it is pinching out fast. The heaviest body is the west body of the two above described. At 1150 feet, the ore has been found to extend 380 feet south of the Crownpoint line, at least, but it may go 50 feet further. It yields $25 per ton. At 1200 feet, 60 feet from the Crownpoint line, the east body of the Crownpoint is visible 50 feet wide. At fifty feet above the 1300-foot level, the ore is only 15 feet wide, and has been worked for 400 feet south of the north line, where it was, at least, 60 feet in width and of excellent quality.

At the 1300-foot level, connections are made with the Overman, the Crownpoint, and, through the latter, with Yellow Jacket and Imperial. Below the 1300-foot level, from 90 to 100 feet in length, south from the Crownpoint line, has been extracted. The ore is now 12 to 15 feet in width at this point, and will extend 130 to 150 feet (in all) southward from the north line, so that, possibly, 40 to 50 feet of ore-ground is standing here yet. At the 1400-foot level, 120 feet south of the north line, a winze has been sunk, which shows ore down to the 1500-foot level. (Gold predominates over silver; assays, gold, $44 60; silver, $8 10). There are two more winzes here, north, which also connect with the 1500-foot level, but the ore is not over $35 per ton. At tne 1400-foot level, about 400 feet south of Crownpoint, the quartz becomes wider, carrying less silver the further south it extends, but it also lies much flatter to the east. This quartz, I believe, is the southern portion and terminus of the east body of Crownpoint. In all these stopes, and below the 1400 to the 1500-foot levels, there are, possibly, 12 to 14 months of ore reserves at the rate of 400 tons per day, of $31 per ton milling value. The product now is about 500 tons per day, varying from $27 to $35 per ton. In the ground between the 1200 and 1400-foot levels, several cross-drifts eastward were run, one of them being 200 feet in length; but no east wall was encountered. Hence, as far as explored, the vein has really a width of over 400 feet, and no east boundary as yet. On the 1400 foot level, the west clay lay 168 feet east of the incline, but the west quartz of Crownpoint and Yellow Jacket, above named, into which the upper ore-bodies pinched, does not exist here in Belcher South. Exploration ought to be carried on eastward much further than has been done up to date. The product of Belcher for the year was about the same as of Crownpoint, that is to say, the tonnage. The *quality* of the ore was better in Belcher. Mr. DONELLY, the foreman, has adopted a good principle. The mine has in the west wall a streak of soft porphyritic material, in which the company have sunk a shaft 12x6, which is used as an air and timber-lowering shaft. Through it, splendid ventilation is produced. One of these shafts had been constructed before, but was lost by fire from the 1050-foot level up. It will be sunk west of the incline and all levels will be connected with it.

BURLEIGH'S air-compresser and drill do very good service; the sinking of winzes, hoisting of timbers to the stopes, etc., etc., are very much facilitated by the engines used under ground, fed with compressed air from the surface; and it is only by using them that prospective work can be carried on as extensively as is now the case, in spite of the natural temperature.

The *Overman.*—This mine has attained a depth of 1150 feet, of which 200 feet were sunk this year. The ground, 500 feet north of the new shaft, was explored by a winze which showed ore, in seams, of very good quality. The vein was 200 feet wide, and the 900-foot level, showed 18 feet width of quartz which was ore-bearing for 200 feet in length. The quartz of the 1300-foot level of Belcher somewhat resembles this, but they are probably not the same body. The ore is sparingly distributed Not enough work has been done to permit any conclusion as to the future developments. The 1100-foot level has been opened 60 feet west of the shaft, and the ground has been explored for a short distance south and north. Nothing of note has been developed. The ground yields a large bulk of water, which necessitates the erection of new pumping machinery and which will retard all work for some months, this coming season. South and west of Overman, every inch of ground has been re-located and incorporated, and stock issued. The western quartz-bodies which lie in American Flat have given much employment to miners and capitalists during the past year. But nothing noteworthy has been exposed. Much low-grade ore exists in the western red quartz-body which courses through Devil's Gate, and through American Flat, and some of the companies located thereon are producing from it.

On the southern and south-western branch of the Comstock, towards Devil's Gate, very extensive explorations have been made during the year, and the ground east of Justis, and in Justis, has disclosed, to the east of the so-called Red ledge, (which undoubtedly is the south and south-east outrunner of the body which made Overman, etc., so famous in former times), a body of white quartz, very similar in its nature, its character of ore and minerals, to that which constituted the west body of the Crownpoint 1200-foot level. In the Justis ground it contains detached ore-seams in which the ores are barely discernible from those of Crownpoint, and assay very high. Mr. LUCKHARDT could not make a close examination, since the development is very recent. The same quartz is 50 to 60 feet wide in the Silver Hill and Dayton mines, further south-west from the Justis; but it does not carry the ore as yet. Probably, during this year much valuable ore-ground will be exposed in this direction. The folly of incorporating questionable titles or ground begins already to show itself between Justis and Woodville. I believe that only a *connection in ore* between the two mines will settle the ownership. This is the best practical proof, and is not bad, geologically, even.

The Dayton, Silver Hill, Woodville, etc., have extracted much ore within the year from the red quartz-body, and extensive machinery is under erection, or has already been erected, to search for, and thoroughly explore, the new white quartz-body. The Silver Hill has attained a depth of 368 feet vertically, and has explored the ground for 1440 feet N. W. and S. E., and 360 feet N. E. and S. W. The Red ledge pinches at 334 feet depth, the quartz (white) is 50 feet wide here, and lies to the South, widening. It shows by assay from $5 to $15 per ton, but is not compact enough here to carry ore. Apparently the red quartz has had even at this level some influence upon it; and it is not unlikely that farther east and south-east, possibly a few hundred feet from the present workings, the porphyry will be less abundant and quartz will predominate, when ore in paying quantities may be expected. The Red ledge carries an abundance of low-grade ore, which will pay the company's expenses for one or two years to come. It carries principally gold. The company is erecting heavy machinery. The same may be said of the Dayton mine. It has attained 450 feet depth, with explorations of the ground, 750 feet north and south by 200 feet east and west. The Red ledge shows much fair milling ore in sight, but begins to give out at, or near, the 280-foot level. The white quartz sets in at about this depth to the East of it, and looks very promising. Assays of it show predominance of the silver over the gold. In Mr. LUCKHARDT'S opinion, which seems to me based on sound local analogy, the increase in bulk of this quartz-body will be attended with the appearance of more compact ore.

Notes.

A Case was recently tried in the Birmingham County Court, when it was ruled that an employer was entitled to discharge a workman for being drunk, and that such workman could not claim pay in lieu of notice or other like compensation.

Experiments on Steel.—At a recent meeting of the French Academy of Sciences M TRÈVE communicated the result of the researches he had undertaken with M. DURASSIER on the relations which exist between the nature of steels and their coercive force. M. DURASSIER prepared fifteen bars of steel divided into five series, differently carburetted, of three bars, each one of which had been tempered in a distinct and especial manner. M. TRÈVE magnetised these bars with a saturation, and determined their magnetic force by the method of deflection. The bar, dosed with carbon to 0·95 per cent., and tempered with cold water, caused a maximum of deflection, represented by 47. The bar containing the same percentage of carbon, but tempered with boiling water, gave 44. The bar, containing the same amount of carbon, but tempered in oil, at 10 deg. centigrade (50 deg. Fah.) gave 43. The influence of the liquid used for tempering is, therefore, manifest. The influence of the percentage of carbon in each bar is not less, for the bar containing 0 95 per cent. gives a maximum of 47, while that containing 0·25 per cent. only gives 13. In preparing diagrams of variations for the different series of bars, the influence of the percentage of carbon and the tempering liquid became manifest. It was remarked, however, that, at the top of the scale in carbon, the nature of the tempering liquid no longer exerted a very marked influence; 47, 44, and 43 are very near one to the other; coercive force is but little manifest in steels whose percentage of carbon exceeds from 0·5 to 0·55 per cent. Another remarkable fact is the similarity of the magnetic curves and curves of elasticity of the bars. Carbon gives elasticity to the steel, and, at the same time, a capacity for magnetism.

Cost of Ore Reduction at Eureka, Nev.—The White Pine *News* gives the rates charged at Eureka for the reduction of ores; it will aid some of our mine owners in estimating what kind of ores will pay for shipment and reduction. It would seem from the rates charged that nothing less than one hundred dollar ore would pay for shipment, which is comment enough to induce capitalists to build furnaces here, owing to the fact that there is a large amount of ore already taken out which will pay from sixty-five to seventy dollars per ton. Contracts will be made to furnish any amount of ore that will pay the above named sums per ton.

The following rates, free of smelting charges, will be paid for gold and silver bearing ores at the Eureka Atlas Smelting Works:

Ores assaying		50	dollars	per ton,	16	per cent.	of value.
"	"	60	"	"	25	"	"
"	"	70	"	"	35	"	"
"	"	80	"	"	43	"	"
"	"	90	"	"	45	"	"
"	"	100	"	"	50	"	"
"	"	150	"	"	55	"	"
"	"	200	"	"	58	"	"
"	"	225	"	"	60	"	"
"	"	250	"	"	62	"	"
"	"	300	"	"	63	"	"

For higher grade ores, rates by special agreement. Lead, over 20 per cent. will be paid for at the rate of 40 cents a unit, until further notice.

Influence of Silicon, Sulphur, Phosphorus and Manganese on the Qualities of Iron.

BY RICHARD AKERMAN, OF THE STOCKHOLM SCHOOL OF MINES.

CONTINUED FROM PAGE 79.

Phosphorus more hurtful for Steel than for Iron poor in Carbon.—If the action of phosphorus is considered in the way just described, it is easily understood why steel is more sensible of phosphorus than iron poor in carbon, for a steel appears to be in the same proportion better, or, as the Englishmen say, to have more "body," as it can, with a certain content of carbon, bear a stronger heating, and the limit is therefore determined just by the danger of its burning. And as a steel is burned more easily in the same proportion as it is richer in carbon, and as the action of phosphorus in this respect is yet stronger than that of carbon, it is thus the case that the richer in carbon an iron is, the more hurtful must the influence of phosphorus upon it be, and that a steel rich in carbon, with a considerable content of phosphorus, must be quite unmanageable at a strong heat.

In the idea, "body" in steel, there is also included that the steel, by renewed heating, does not lose its steel nature in any noticeable degree. In this respect, also, phosphorus exercises a very hurtful influence, for the greater the content of phosphorus is, the greater is the tendency of the steel at every heating to acquire the nature of iron ; which behavior may possibly be explained in this way, that the power of iron to retain carbon in combination, and protect it from oxidizing when heated, is less in the same proportion as iron is combined with more phosphorus.

The Influence of Phosphorus on the Welding of Iron.—In the same way that phosphorus increases the fusibility of iron, it makes it also, when the content of phosphorus is not greater than that the iron may be heated to a welding heat without danger of burning, softer and more pliable when it is heated, and an iron containing a moderate quantity of phosphorus is said to be "*eldvekt*" (weak in the fire). A consequence of this behavior is that iron with a moderate content of phosphorus may be welded at a somewhat lower temperature than that which is poorer in phosphorus, and that when it contains little carbon it may be worked at a moderate heat more easily than that which is freer of phosphorus but contains as much carbon as the other has carbon and phosphorus together.

The differing Sensibility for Phosphorus of Iron refined in different ways.—It has already been stated that different methods of refining have a very different power of purifying from phosphorus, inasmuch as puddling has a very considerable superiority in this respect over hearth-refining, and the latter, again, over the Bessemer method. But this is not all, for the phosphorus remaining in the refined iron exercises besides a very different influence, according as the iron is produced by one or other of the methods of refining, puddled iron being least, and Bessemer iron most sensitive to this substance. As Bessemer metal may in general be considered slag-free, and puddled iron, on the contrary, always contains a finely-distributed slag, it has been attempted to explain the behavior just described by the influence of the infused slag, inasmuch as it is supposed that the films of slag lying between the particles of iron, render difficult the occurrence of so coarsely crystalline a texture as the iron poorer in slag may receive.

The hearth-refined iron is much freer of slag than the puddled ; for the common methods of hearth-refining end with the fusing down of the obtained pieces of decarburized iron, when most of the slag is separated ; but with puddling, there is no corresponding fusing down of the refined iron, whence it follows that puddled iron is always intimately infused with a comparatively considerable quantity of slag. When the iron afterwards is drawn out, the round particles of iron in the puddle-ball are thus stretched out into long fibres, which again are, to a great extent, covered with films of slag, which, indeed, are exceedingly thin, but which not the less may render difficult the occurrence of larger crystalline surfaces than may be formed within every separate fibre. When it is added that proper cold-shortness is not caused by phosphorus, except to the extent that the iron becomes coarsely crystalline, it is thought that there is good ground for the supposition that the sensibility of iron for phosphorus is much greater the freer of slag it is, and that this circumstance is the true reason why phosphorus has so variously powerful an influence on iron produced by different refining processes.

The Quantity of Phosphorus in Iron which approaches the Limits of Cold-shortness.—The difference between the influence of phosphorus on the various sorts of iron is so great, that while nobody ever ventures to use for rails Bessemer *steel* with a greater content of phosphorus than 0·1 per cent., puddle-iron used for the same purpose may contain up to 0·4 per cent. phosphorus ; but it is yet more remarkable that puddle-iron has shown that it could contain 0·25 per cent. phosphorus, without any cold-shortness being produced in it when heated to a white heat (1). According to KARSTEN, (2) also, 0·3 per cent. of phosphorus in malleable iron is not sufficient to cause any brittleness ; bar-iron, with 0·5 per cent. will yet stand trial with the hammer, and even 0·6 per cent. will not render impossible its bending at a right angle in the cold state. KARSTEN, however, does not state by which method of refining the iron examined by him was produced ; but if the contents of phosphorus are correct, which, however, there may be reason to doubt, there is the strongest probability for the supposition that it was puddled, for the experiments made by EGGERTZ (3) on hearth-refined iron, with various contents of phosphorus, have shown that, at least, if the drawing of common blooms is not carried farther than to one inch square, such iron, with only 0·25 to 0·3 per cent. phosphorus, is very cold-short.

It has already been shown that the richer in carbon an iron is, which is at the same time malleable, the more impatient is it of phosphorus; but as regards the separate varieties of steel, with the same content of carbon, cast steel is most, and puddle steel is least sensitive to the substance in question, which again is doubtless caused by the circumstance already stated, that the influence of phosphorus is greater the freer from slag the iron is.

No iron or steel absolutely free from phosphorus can be produced by the common methods, for even if the ores are quite free from phosphorus, the fuel always contains a certain quantity, which is taken up by the iron. The less phosphorus, however, a steel contains the better it is, if other circumstances are similar, and the greatest possible freedom from phosphorus is just the principal requisite for iron as a raw material for steel. Dannemora Walloon iron itself contains commonly about 0·005 per cent. phosphorus, and in varieties of cast-steel of great excellence there may be found from 0·01 to 0·02 per cent. (4).

From the statements that have been made with reference to the way in which phosphorus acts upon iron, it ought finally to be evident that it is, in fact, altogether impossible to determine, for a certain sort of iron or steel, any sharp limit at which the content of phosphorus makes the iron cold-short; for the cold-shortness is, as we have seen, in a very essential degree, dependent on the last handling which the finished wares have undergone. But so much is in the meantime clearly evident, that the greater the content of phosphorus is, the more difficult is it when the iron is treated to prevent its burning, and that the action of phosphorus is more powerful in the same proportion as the iron is richer in carbon and freer from slag.

The Influence of Phosphorus on the cohesive Strength of Iron, its limits of Elasticity and Ductility.—So long as a crystalline texture is not caused in the iron by phosphorus, it exerts no hurtful influence on the iron's cohesive strength; but, on the contrary, both the absolute cohesive strength, and especially the limit of elasticity, are thought in this case to be increased with the content of phosphorus. STYFFE (5) draws the conclusion, from the researches made by him in iron containing phosphorus, that phosphorus, in the same way as carbon, heightens the limit of elasticity, and increases the strength of the crystal particles of the iron, and that the greater hardness of iron containing phosphorus is a consequence of this, but that it does not increase the cohesion between the separate crystals. On the ductility of iron, on the other hand, phosphorus has a yet more hurtful influence than carbon; and when the crystalline texture is produced in the iron, its ductility is naturally very small.

A consequence of the fact that the content of phosphorus considerably diminishes the ductility and heightens the limit of elasticity more than the absolute cohesive strength is that iron comparatively rich in phosphorus before its breaking is commonly little drawn out or lengthened, and that after the limit of elasticity is passed it speedily gives way. Iron rich in phosphorus sometimes breaks just with the load that corresponds to its limit of elasticity.

Finally, the modulus of elasticity of the iron is thought rather to be diminished than increased with the content of phosphorus, and when to this it is added that the limit of elasticity, on the contrary, is heightened, it appears from this that iron containing phosphorus must be very elastic (6). BRUSEWITZ (7) has also found in spring steel from BORSIG's Works, in Berlin, 0·098 per cent. phosphorus.

The Action of Phosphorus on Pig-iron.—Phosphorus makes pig-iron more easily fusible, but yet more promotes its fluidity, so that it can the more completely fill the finest impression of the mould. Pig-iron rich in phosphorus is therefore readily used for cast goods, and the iron used for so-called art cast goods sometimes, according to WEDDING (8) contains up to from 5 to 6 per cent. phosphorus.

KARSTEN (9) and many others following him have maintained that phosphorus, like sulphur, opposes the separation of graphite, and tends to make pig-iron white. Without being altogether able to deny this, it appears to me, however, to be the fact, that if phosphorus has such an action it must be comparatively less than that of sulphur, for otherwise the production of a grey pig-iron from charges containing more phosphorus than usual would be much more difficult than it is.

The influence of phosphorus on the strength of pig-iron is thought to be in complete correspondence with its action on iron poorer in carbon, inasmuch as it diminishes its ductility and increases its brittleness, but at the same time raises its absolute cohesive strength to a certain point. This last, as is well known, increases with the content of combined carbon, but only to a certain limit. If the content of carbon is greater, the cohesive strength is again diminished. The strongest possible cast iron goods must, therefore, have a certain content of combined carbon, about 1·5 per cent., while in common cast iron it is in general much less. In the ordinary cast iron, comparatively poor in combined carbon, phosphorus is now thought, at least when the content of it is not too great, rather to increase than diminish the absolute cohesive strength, for the common varieties of cast iron proved by BAGGE (10), with loads increased little by little, did not, any of them, stand so great a weight as a pig-iron with 1·13 per cent. phosphorus. But it is not therefore asserted that the other kind of pig-iron, richer in combined carbon, which is preferred for the strongest possible cast goods, as cannon, rollers, etc., can contain so much phosphorus without diminution in cohesive strength. Likewise, it is thought, even in such pig-iron a content of phosphorus so moderate as 0·2 per cent. rather increases than diminishes the absolute strength, for although the American cannon pig-iron contains about 0·17 to 0·2 per cent. (11), its absolute cohesive strength is yet somewhat greater than that of a cannon pig-iron from Aker, found by KOLLBERG to contain 0·056 per cent. of phosphorus. In order to be received, the absolute cohesive strength of the American cast-iron cannon must rise to at least 395·9 lb. per square line (12), while KOLLBERG found the highest cohesive strength of the cannon iron from Aker to be 372 lb. per square line.

The cohesive strength ascertained by gradually increased loading is, however, far from determining by itself the power of iron to withstand shocks or sudden exercises of force; and, as phosphorus diminishes the ductility, there is no doubt that cast-iron for such articles as will have to stand sudden strains is the better the less its content of phosphorus is.

Most Swedish varieties of pig-iron contain very little phosphorus (0·01 to 0·05 per cent.); but, on the other hand, common pig-iron generally contains 0·4 to 1·5 per cent. phosphorus, and PERCY (13) even speaks of pig-iron with 6·94 per cent. phosphorus.

Phosphorus to some extent diminishes the propensity of Iron to rust, which behavior certainly stands in connection with its power to protect iron from the action of acids.—*Iron.*

TO BE CONTINUED.

(1) "JERNKONTORET'S Annaler," 1866, p. 62.
(2) "Eisenhüttenkunde," 3te Ausg. T. 1, p. 420.
(3) "JERNKONTORET'S Annaler," 1859, p. 20.
(4) "JERNKONTORET'S Annaler," 1859, p. 23.
(5) "JERNKONTORET'S Annaler," 1866, p. 63.
(6) "Annales des Mines," 6ième Série, T. 17, p. 346.
(7) "JERNKONTORET'S Annaler," 1871, p. 234.
(8) "Grunddriss der Eisenhüttenkunde," p. 8.
(9) "Eisenhüttenkunde," 3te Ausg. T. 1, p. 434.
(10) "JERNKONTORET'S Annaler," 1863, p. 125.
(11) "JERNKONTORET'S Annaler," 1868, p. 239.
(12) "JERNKONTORET'S Annaler," 1868, p. 248.
(13) "Metallurgy ; Iron and Steel," p. 514.

New Iron Mines in Norway.

THE *Revue Industrielle* informs us that immense deposits of iron ore of excellent quality have been discovered at Nordland, in Norway, so conveniently situated, as regards transport, that they cannot fail to play an important part in foreign markets. The mines are nearly seven miles from a gulf of deep water, accessible to vessels of every size, and navigable throughout the year. A pier may also be constructed without great cost. The gulf, which is named Skjærstad, is near the town of Bodo ; and the road to the mines is so favorable to the construction of a railway that a narrow-gauge line would not cost more than £20,000. The deposits themselves have been explored by the most skillful Norwegian geologists. On making some excavations, under surface strata of slight thickness were found thick deposits of pure oligist iron ore capable of yielding 60 to 70 per cent. of metallic iron, and cropping out to the surface at the two ends of a calcareous formation 1300 yards long, called Nœverhaug. The deposits which have already been laid bare extend over a surface of about three acres, and are practically inexhaustible. In comparing this mineral wealth

with that of Dannemora, in Sweden, everywhere so well known, one can form an idea as to the deposits which have just been discovered. The largest mine, on the west side of the Nœverhaug is, at any rate, as large as the two important mines of Dannemora, Mellanfaltet, and Södrafaltet, and there is every reason to believe, from the geological appearances, that the whole of the deposits are four times as large as those of Dannemora. A Swedish company that has bought the mines will proceed to practical explorations. What lends this ore a special interest is, that it differs in several respects from what has hitherto been discovered in Sweden. All these ores are magnetic iron, impregnated more or less with sulphur and titanium. The Nœverhaug ore, on the contrary, consists of oligist or micaceous iron, and analysis has established that contains no titanium at all, and only traces (0·01 per cent.) of phosphorus. This ore is, consequently, an excellent one for the Bessemer process, and sufficiently rich to be used with the prospect of a large profit. The deposits are, besides, of such a size that working on a large scale may be carried on, so that in a few years we may expect to see ores exported from Norway capable of competing with those of Spain and Algeria.

Mines North of Elko, Nevada.

THE following is from a correspondence bearing date of Elko, July 12, 1875, to the Chicago *Inter-Ocean:*

At Cornucopia, the Leopard Mine completed its ten-stamp mill in February last, and has since turned out from $10,000 to 13,000 per week in silver bullion. Its vein is three to three and a half feet wide, and runs very high in silver. The value of the ore in sight is estimated at a fabulous figure.

The Consolidated Leopard, Hussey, Black Diamond, and Republican Mines in its vicinity are being worked with vigor, and all show, in a greater or less degree, large bodies of rich ore. The veins in this district are generally not distinct, and the permanence of the ore, to some extent, is as yet a matter of speculation.

Wyoming District is of newer creation, and is noticeable for its large clearly-defined vein, attaining its greatest width on Silver Mountain. The Mardis Silver Company, of Chicago, occupy 1000 feet of this vein near the summit of the mountain, 1600 feet above the valley. This mine is noted for the magnificent and substantial character of the walls or casing of its vein, for the width of vein, and high value in silver of the ore. The vein is seven to eight feet in width, of rich sulphurets and chlorides of silver. The company has developed the mine by shafts and levels, with the evident intention of demonstrating its value before putting up a mill. An immense quantity of ore has been exposed, much of which lies ready for reduction. Large quantities have been freighted, by wagon and railroad, 225 miles to mill, and have returned from $250 to $400 per ton in silver. By many the average value of the ore is estimated at $200 a ton. This mine, owing to its permanent casings and wide vein of rich ore, is considered by many the most promising mine in this part of Nevada. A mill similar in size to the new Leopard mill will be put in here by Fall, and a lively competition will doubtless exist as to which shall ship the most bullion.

Cheap wood and good water will enable the ores of this district to be cheaply reduced. The Rosebud and Last Chances, near the Mardis, and probable extensions of it, are the only other mines in this district as yet having any special development; in the main they resemble the Mardis, but have as yet no character by themselves. They may be considered, however, very promising. Many locations have been made, and some work done on them, for which the owners demand big prices—a consequence of the success of the Mardis Mine. While some are doubtless good, most are of little value.

Island Mountain District has excited interest for its placer mines. The Gopher Company, Penroyd & Mayhon, Little Giant Company, Norton & Co., etc., are working from ten to thirty men each, averaging from $8 to $15 per man. Hydraulic mining is here practised. Bringing the water to the vicinity of the gold deposits, under a head of 150 feet, it is directed in a solid stream against the banks, by its force crumbling the hills and carrying the earth and small stones into the long sluice boxes, where the gold by its greater gravity sinks, the water carrying off the earth or tailings. Nuggets have been found here of as high value as $20, but the gold is principally fine dust. The introduction of hydraulic mining has made placers of this kind valuable, which by the old means of hand power could never have been made to pay.

Practical Notes on the Management of Gas Works.*

CONTINUED FROM PAGE 80.

CONDENSER, SCRUBBER, ETC.

EFFECTS OF TEMPERATURE ON CONDENSATION.

IN severe cold weather, measures should be taken to protect the condensing tubes, which may be simply done by wrapping them round with hay or straw bands. The illuminating power of coal gas is considerably diminished when cooled down below 50°: much of the illuminating material is condensed, and the quality of gas affected accordingly. The richer the gas, the more exposed is it to be acted on by a low temperature.

ARRANGEMENTS FOR INCREASING OR REDUCING THE CONDENSING POWER.

The condensing power is considerably influenced by the description of coals used, some coals yielding twice as much aqueous vapor as others; for this reason, and in order to increase or diminish the amount of condensing power at pleasure, the condensers should be arranged accordingly; the ordinary ventilating or annular condensers, for instance, should be provided with plates or "dampers," for closing or shutting off the current of air through the internal tubes, and also with pipes connected to a convenient water supply, and arranged for causing water to trickle down the surfaces of the outer tubes. This is easily effected by forming the cap of each cylinder into a trough perforated with holes drilled into it in such a manner that the water will be directed on to the upper parts of the tubes, run down their surfaces vertically, and pass off to the syphon or dip boxes.

COOLING EFFECT OF WATER AND AIR.

The cooling effect of water evaporated on the outside of the condensing pipes is much greater than if they were submerged in water, owing to the heat which passes from a sensible to a latent state during the formation of vapor; the more rapidly the vapor is formed, the greater will be the cooling effect.

By thus arranging the condensing tubes, it will be evident that the cooling or condensing power may be increased or diminished to a considerable extent, and made to suit the varying conditions of the seasons, climate, position, coal, etc.

The relative effects of water and of air for the condensation of gas have been experimentally determined by PECLET to be as follows:

Excess of Temperature in the gas.	Quantity of heat lost by a square unit of exterior pipe surface.	
	When radiating in air.	When plunged in cold water.
For an excess of 10°	8	88
" " 20°	18	266
" " 30°	29	5,353
" " 40°	40	8,944
" " 50°	53	13,437

From this table, it will be seen that the condensing effects by water increase in a much greater ratio than by air, in proportion to the excess of heat.

SCRUBBERS.

The coke or breeze in the scrubbers should be renewed twice a year, and they should, at the same time, be thoroughly cleaned out; the coke should be in pieces not larger than the fist. When in action, water should be occasionally showered over the coke, according to the size of the scrubbers, for the purpose of removing the tar and fatty oils adhering to the coke.

The operations are similar where the ammoniacal liquor is used instead of water, the only difference being that the ammoniacal liquor passes off into a well apart from the ordinary tar well, but connected to it, whence it is pumped into a cistern placed above the scrubber so as to command it.

The action of the scrubber is partly chemical and partly mechanical: the coke, etc., which it contains, presents a large surface to the gas in its passage through it, to which the tar and other matters still remaining in the gas after condensation adhere; the water, or ammoniacal liquor, carries off these depositions to the syphon or dip boxes: the scrubber, in this manner, relieves the purifiers to a considerable extent, as the tar would, more or less, form undercoatings to the layers of lime, and retard their proper action.

BY-PASS FOR SCRUBBERS.

The scrubber should be provided with a by-pass, so that the gas may be shut off from it during the operations of renewing the coke, etc.

WASH VESSEL.

The wash vessel is now seldom used, being replaced by the scrubber, as it is considered that some part of the olefiant gas and heavy carburets are absorbed by the water, to the deterioration of the gas.

EXHAUSTER.

EFFECT OF PRESSURE ON THE RETORTS.

Owing to the pressure induced by the resistance to the passage of the gas through the hydraulic main, scrubbers, purifiers, station meter, etc., and by that given by the weight of the gas-holders, a considerable portion of the carbon contained in the gas, the amount varying with the pressure given, is deposited on the internal surfaces of the retorts, thereby reducing the yield of gas, materially affecting its quality, and increasing the consumption of fuel, owing to the deposited carbon being a non-conductor of heat. The evils arising from this cause are most felt in large works, the pressure being necessarily much greater than in smaller ones; and also where clay or brick retorts are used, which, from their porosity, leak to a considerable extent under such circumstances.

Some years ago, Mr. GRAFTON made some practical experiments on the influence of pressure on the deposition of carbon. By increasing the pressure to 14 inches head of water, the deposit amounted to one inch in thickness in a week, and in two months it had filled up nearly one-fourth of the retort. On the other hand, by taking off the whole of the pressure excepting that given by half-an-inch dip in the hydraulic main, there was scarcely any deposit at all after the expiration of four months, and with the same description of coal.

SIZE OF WORKS TO WHICH AN EXHAUSTER IS APPLICABLE.

Works wherein the use of an exhauster will be found to be of advantage scarcely fall within the province of the present treatise, but a few remarks may, nevertheless, be made on the subject.

The cost of working an exhauster of the smallest description in the most economical manner, including repairs, etc., varies from £30 to £60 per annum; the boiler may be placed so that the heated contents of the main flue from the retort stack are made to pass around it, in order to economise fuel; and the fuel used may consist of breeze or small coal; the labor to be shared between an ordinary night and day man, who should receive an extra weekly sum for this duty. Taking the average working cost at £45 per annum, it is now a matter of easy calculation to ascertain the size of works to which it would be an economical appendage, the result of taking off the pressure by its means being an addition of ten per cent. to the yield of gas, on the average. A gas works requiring a yearly production of 4,000,000 cubic feet of gas, including a leakage of ten per cent., would, by the aid of the exhauster, increase the amount to 4,500,000 cubic feet, leaving an available quantity for distribution of 4,000,000 cubic feet; or, if no more than 3,600,000 cubic feet were required for the purposes of distribution, then the quantity of coal used, of lime, labor, wear and tear, fuel, etc., would be reduced accordingly; the cost of the gas, therefore, and not its selling price, should be calculated in order to show the saving effected; assuming, therefore, that the cost of the gas at a minimum is 2s. 6d. per 1,000 cubic feet, and the extra yield to be 400,000 cubic feet, the saving will be 400 × 2s. 6d. = £50.

It may, therefore, be safely assumed, that an exhauster cannot be used economically in works on a smaller scale than the above, and in that case, even, no material advantage is gained by its use commensurate with the increased outlay and expense.

DESCRIPTION AND ARRANGEMENT OF EXHAUSTER.

There are many descriptions of exhausters in use, but for the smaller sizes of works in which its use is admissible, an exhauster consisting of two pumps, working together, and actuated by a small steam engine, is the simplest, and the least liable to get out of order.

A great objection to the use of exhausters, apart from their first cost and maintenance, is their liability to over-action, and drawing in atmospheric air from the open retorts, thus forming an explosive compound in the gas-holders, and reducing the illuminating power to an extent proportionate to the quantity of air thus introduced. The pressure should not be allowed to fall below that given by the dip pipes entering the hydraulic main from the retorts, so that the seal there is maintained intact. The action of the exhauster should be controlled by a small gas-holder floating in an iron tank, and regulated to the

* From notes compiled by W. C. HOLMES & Co., Engineers and Contractors of Gas Works, Huddersfield, England. We shall be pleased to hear from our managers of gas works as to the way they do these things, and wherein our ways are improvements on the English.

pressure required by means of counterbalance weights, etc., the rising and falling of this holder (effected by a stream of gas introduced within it) to actuate a lever which is connected with a throttle valve placed on the steam pipe, thereby adjusting the supply of steam from the boiler to the steam cylinder. In this manner, the speed of the engine, and consequently that of the exhausting pumps, is regulated to the quantity of gas which is being generated; a throttle valve, also, actuated in a similar manner by the governing holder, should be placed in a pipe connecting the inlet and outlet pipes of exhauster, for the purpose of adjusting the pressure on the inlet side, in case the action of the exhauster should reduce that pressure to too great an extent; a self-acting by-pass valve should also be placed in the connection between the same pipes, and so balanced, that it will be opened by the pressure of the gas on the outlet side, in case that pressure should materially exceed that on the inlet side; the exhauster should also be provided with a pressure gauge on both the inlet and outlet pipes, and with a by-pass for shutting it off in case of derangement, etc. As the construction and arrangement of the exhauster, with proper appliances, as indicated above, are matters unconnected with the management, and as the management is thereby reduced within a very small compass, little more need be said here, than that the attendants should particularly note the indications given by the pressure gauges, and maintain the pressure as uniformly as possible. The action of the exhauster depends on the regularity with which this is done, and to it the attention of the workmen should he more especially directed. The charge of the engine and boiler, etc., are too well understood to require any special notice.

(TO BE CONTINUED.)

Notes.

Peat Machinery.—Cuyahoga Iron Works have lately shipped a lot of heavy peat machinery to Morrison, Ill., to manufacture peat by the hydraulic pressure process, by a party of Cleveland capitalists.—*Manufacturing and Trade Review.*

Seller's Rotary Puddler.—Some improvements upon their former invention of rotary puddling furnaces have been made by Messrs. W. & G. H. SELLERS, of Philadelphia. In their patent of 1873 there are described certain provisions for a water circulation about the closed end of the rotary puddler, one of the objects of that circulation being to enable the flux to withstand the action of the flame impinging directly upon it. In the practice of that patented improvement it has been found that the flux was entirely protected at the closed end of the puddling vessel by this water circulation, and throughout the cylindrical part by the fluid cinder, but that in melting the iron in the puddling vessel, the open end, being exposed to the action of the flame at all times, and protected by the cinder only during the boiling process, was deprived of the cinder which cemented it, and was liable to crumble under a too prolonged exposure between its cinder baths. The present invention has for its object, therefore, the protection of the flux at the opening end of a puddling vessel by a water circulation and, while accomplishing this, to confine such protection to the smallest space, so as to avoid a useless waste of heat and water; and it consists in providing an annular circulation pipe within the open end of the rotary puddling vessel, and in maintaining a circulation through this pipe from and to the journal at the closed end of the vessel through which the water is supplied and discharged.

An Air Engine.—A Glasgow paper gives an account of a new street car propelled by compressed air, which has successfully passed a public test in that city. The atmospheric air is pumped into six tanks underneath an ordinary street car, and is made to act on two engines, also under the car. The floor of the car is "about the same height from the ground as the floor of an omnibus." The tanks are to be filled from receivers stationed at convenient distances along the routes, the time occupied in filling them being only two minutes. At the trial of the car it ran about 1,400 yards at a maximum speed of twelve miles an hour. No mention is made of the load, if any, put upon the car. Several patents have been issued in this country for air engines intended to propel street cars, and the principle of filling tanks on the route is now used on a street car line in New Orleans, which uses steam thus stored to propel the car. A car of the latter kind was run from the depot of the Sixth Street Railroad Company, Philadelphia, to Frankford and back, with a dozen or more men on board, some time ago, but it was almost as objectionable, on account of noise and escaping steam, as an ordinary "dummy" engine, and was a clumsy looking machine. One propelled by compressed air should have a decided advantage over the Fireless Locomotive driven by steam, especially in cold climates. There is a company in Philadelphia organized for the purpose of providing power from steam stations intended to be constructed in the outskirts, the power to be furnished in strong steam cylinders to any horse railway company that may desire to avail itself of that method of propulsion. Thus far, however, the company has made but little progress.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending July 24:

	1875.		1874.	
	Week.	Year.*	Week.	Year.
Wyoming Region.				
D. and H. Canal Co.	59,016	1,771,266	30,234	1,358,850
D. L. and W. RR. Co.	77,271	1,910,218	36,467	1,406,788
Penn. Coal Co	27,968	726,647	28,636	699,446
L. V. RR. Co.	27,109	480,453	13,316	565,344
P. and N. Y. RR. Co.	1,598	63,667	955	35,662
C. RR. of N. J.	47,716	427,503	1,760	739,693
Penn. Canal	13,773	49,766	9 310	160,505
Lack. and B. RR.	1,899	81,493	2,230	112 529
	256,350	5,511,013	122,908	5,078,817
Lehigh Region.				
L. V. RR. Co	80,349	394 813	61,980	1,753,550
C. RR. of N. J.	35,372	98,869	19,732	572,409
D. H. and W. B. RR.	1,832	37,855	1,860	16,540
	117,553	531,537	83,572	2,342,499
Schuylkill Region.				
P. and R. R. RR. Co.	182,581	1,354,404	118,957	2,556,177
Shamokin and Lykens Val.	30,840	638,850	21,935	465,186
	213,421	1,993,254	140,942	3,021,363
Sullivan Region.				
Sul. and Erie RR. Co.	..	5,557	755	19,736
Total	587,324	8,041,361	348,197	10,462,415
Increase	238,127	..	..	..
Decrease	..	2,421,054	..	..

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about seven per cent. of the whole production.

The following Table does not give the entire production of our Bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the week ending July 24, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.	49,665	1,231,124
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb.	7,[illegible]4	167,506
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	3,581	120,454
*East Broad Top	640	25,721
Clearfield Region, Pa.		
*Snow Shoe	894	39 108
*Tyrone and Clearfield	16,509	459,640
Allegheny Region, Pa.		
*Pennsylvania RR.	3,641	133.483
Pittsburgh Region, Pa.		
*West Penn. RR.	4,634	119,601
*Southwest Penn. RR.	184	4,836
*Penn. & Westmoreland gas coal, Pa. RR.	19,909	309,598
*Pennsylvania RR.	10,554	217,675
Kanawha Region, W. Va.		
Chesapeake and Ohio RR.	2,488	92,606

* To July 21.

Bituminous Coal Production to July 1st, 1875.

The following does not include the total production, but such quantities as have been reported to this office:

Pennsylvania	4,351,748
Ohio	313,579
Maryland	1,198,010
Illinois	454,217
Indiana	26,041
Iowa	50,381
Wyoming	61,369
West Virginia	80,325
Tennessee	43,087
Alabama	28,269
Colorado	12,096
	6,819,116

The Production of Coke for the week ending July 21.

Tons of 2000 lb.	Week. Tons.	Year. Tons.
Tyrone and Clearfield	..	273
Alleghany Region	..	53
West Penn. RR.	1,233	28,552
Southwest Penn. RR.	8,787	288,626
Penn. & Westmoreland Region, Penn. RR.	1,045	16,287
Pittsburgh, Penn. RR.	2,508	56,364

The receipts at Port Richmond for the week were 75,000 tons, shipments 75,000 tons, and balance on hand 50,000 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania Railroads amounts to 41,745 tons.

The Exports of Coal from Baltimore for the week were 000 tons, and for the year, 28,029 tons as compared with 55,913 tons to the corresponding time in 1874.

The receipts at Buffalo, via L. S. and M. S. RR. for the week were 3,971 tons. The exports by Lake were 5,425 tons, and imports 3,900 tons.

Belvidere Delaware RR. report:

	Week.	Year 1875.	Year 1874.
The receipts of coal at Coal Port (Tr'ton)	9,857	19,840	153,896
" " " South Amboy	9,620	41,150	382,248
Shipments of Coal Port (Trenton)	7,686	15,510	153,653
" South Amboy	5,211	108 818	352,577

Shipments from Pictou, N. S, for the week ending July 10:

	Tons. Week.	Year.
To United States	1115	7485
" West Indies	1107	1107
" South America	—	1002
" Canada	9569	38637
" Other Provinces	2630	16290
	14,421	64521

Shipments from the Block House, Cow Bay, C. B., to the following destinations, for the week ending July 1:

	Week.	Year.
Provinces	505	3115
West Indies	..	806
United Stated	1054	1054
	1559	4975

COAL TRADE REVIEW.

Duties.

Anthracite free, *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c. gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, Friday Evening, July 30, 1875.

Anthracite.

With the exception of a good demand for such qualities of coals as were out of the market during the first six months of the year, business is exceedingly dull, although stocks have not accumulated to a great extent. The Delaware, Lackawanna and Western Company appear to have the largest unusual accumulation. The Delaware and Hudson Canal Company have an accumulation of less than 200,000 tons at Weehawken, Rondout and Honesdale, while at this time last year they had a total at these points, of about 430,000 tons. The Lehigh companies are unable to meet the demands for their coals, as is the case with the Philadelphia and Reading Coal and Iron Company, for their red ash coals. The Lehigh and Wilkes-Barre Coal Company continue busy supplying their contractors. Prices are fairly maintained, although considerable concessions have been made on cargoes of softer coals under demurrage. A contract for the delivery of 5000 tons of steamboat coal, at the Brooklyn Navy Yard, was awarded last week at $5 17 per ton. This figure is considered as being very low, and many doubt the ability of the contractor to honestly fill the contract at a profit. By others it is said, however, that an abundance of this coal can be bought at $4 95, and that, as the Government will unload the coal, the freight will be but 18 cents per ton, which will leave a profit of 3 cents per ton, and that a sufficient quantity will be delivered at prevailing prices, with the expectation of delivering the balance due on the contract after the expiration of season prices. SAMUEL G. FRENCH received the contract for delivering 2800 tons of Lehigh broken to the Brooklyn Alms House, at $6 97 per ton. A. S. SWORDS quotes Pittston coal, at Newburgh, as follows: lump and steamer at $5 00; grate, $5 15; egg, $5 30; stove, $5 80; and chestnut, $4 80.

The production last week shows an increase of about 20 000 tons over the previous week. The shipments last week were 587,324 tons, and since January 1st, 8,041,361 tons, or 2,421,054 tons less than for the corresponding time last year. The mines are not working to the satisfaction of such companies as have contracts to fill, but the present output will be materially increased if it is found desirable.

Mr. CHARLES PARRISH, President of the Lehigh and Wilkes-Barre Coal Company, was before the Investigating Committee of the Pennsylvania Legislature last week, and gave in evidence the working of the Anthracite Coal Combination, the particulars of which have, from time to time, been published in the columns of this journal. The substance of his evidence was that, previous to the formation of the Combination, the mining of Anthracite coal was done at an absolute loss, and that the Combination was formed to regulate production and prices, to enable them to make reasonable profits. We would regret equally to see anthracite coal mining an unprofitable business, or to see exorbitant prices charged for the coal. We are of the opinion, however, that the laws of supply and demand are likely to regulate the business and the price of coal better than any Legislative action. The largely-increased facilities for producing bituminous coals, in connection with prospective competition in freights on these coals, will most probably be the future incentive to encourage economy in anthracite mining, and to prevent the establishment of exorbitant prices.

Reports come from Plymouth that three miners, who worked at Mr. CHARLES HUTCHINSON'S mines during the strike, were attacked by "buckshots" and barely escaped with their lives. This class of offence should be severely dealt with, and the laborer be protected in offering his services at whatever value he may see fit to place upon them.

Bituminous.

The demand for all kinds of bituminous coals is very light, and considerable has been sold at figures below regular quotations. In Cumberland, although we hear of a number of transactions at lower figures, the bulk of the business, or several thousand tons, have been sold

during the week, in lots, at $4 at Georgetown, but it was upon as good coal as this region affords, that this figure was realized. Clearfield, Allegheny and Broad Top Coals are very quiet, but a better trade is looked for by the 1st of September. The production of Cumberland Coal showed a falling off of about 10,000 tons last week, as compared with the previous week. Some of the companies have such large stocks at Georgetown and Alexandria, that they are compelled to stop work. The shipments by canal, according to our latest reports, are confined to the Consolidation Coal Co., the Maryland Coal Co, the Borden Mining Co, and the American Coal Co. Freights from Cumberland to Georgetown were lately reduced to $1 15. It is thought that this was done with the expectation of bringing about a general strike among the boatmen, and result to the advantage of such companies as have no orders; but the movement failed; the boatmen realized their position and submitted to the reduction. The decrease in the shipments of Cumberland Coal over the Baltimore and Ohio R.R. last week, as compared with the corresponding week of 1874, was about 10,000 tons, and the total decrease this year is over 100,000 tons. Owing to extra inducements offered to shippers, the business has been transferred to the Chesapeake and Ohio Canal. The indications are that the loss to the railroad will be very materially increased before the end of the year. This is a trade the railroad company can well afford to conciliate, even at a considerable reduction of freights. It appears to be a more profitable business than some they are now competing for.

Foreign and Gas Coals.—There have been no further arrivals or sales of foreign coals. American gas coal is being shipped entirely on account of contracts. We note the sale of 1,000 tons of Cannelton splint to a gas company in this city, at $6 per ton delivered.

Freights.—Coastwise freights continue nominally unchanged. Vessels are somewhat scarce at Georgetown and this city.

Wholesale Prices of Anthracite Coal for August f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna and Scranton at Rondout and Hoboken	5 00	5 10	5 20	5 45	5 90	4 90
‡Pittston at Newburgh	5 05	5 05	5 15	5 30	5 80	4 85
Wilkesbarre at Port Johnston	5 00	5 10	5 20	5 45	5 90	4 90
Plymouth, R. A., Nef	....	....	....	5 45	5 90	4 90
Susque. Coal Co. at Amboy W.A.	....	....	....	..	....	....
Kingston at Hoboken	....	....	..	....	....	....
Lehigh Coals.						
Old Company at Port Johnston	5 55	....	5 45	5 55	5 90	5 10
Old Company's Room Run "	....	....	....	....	....	....
§Sugar Loaf, Hobok. & Amb."	5 55	....	5 45	5 55	5 90	5 10
Lehigh Coal Exchange "	5 55	....	5 45	5 55	5 90	5 10
Honey Brook Lehigh	5 55	....	5 45	5 55	5 90	5 10
Spring Mt. C. Co. at Hoboken	....	....	....	....	....	....
Beaver Meadow at South Amboy	5 55	....	5 45	5 55	5 90	5 10
†Schuylkill Coals at Port Richmond.						
Schuylkill white ash	4 50	4 60	4 70	4 95	5 40	4 40
Schuylkill red ash	....	....	5 00	5 05	5 45	4 40
Shamokin white and red ash	....	....	....	5 25	5 55	4 45
Lorberry	....	....	5 70	5 70	5 70	4 60
Lykens Valley	....	....	6 30	6 30	6 30	5 45

Per ton.

Freight from Hoboken and Weehawken to New York.... 40c.
" " Elizabethport & Port Johnston to N. York. 45c.
" " South Amboy to New York.... 50c.

*Freight on Lackawanna coal from Rondout to New York, by boats or barges of the D. and H. Canal Co. 50c. per ton. The expense of towing vessels from New York harbor to Rondout and back will be borne by this Company.

†Freight from Port Richmond to New York (free of discharging) 85c. per ton.

‡Prices to the Trade.

§By Canal at New York, Jersey City and Brooklyn, 30c. additional alongside.

Schuylkill coal is delivered f.o.b. of boats in New York harbor at 50c. per ton additional to these rates.

Pittston coal is delivered to carts in New York or Brooklyn at 65 cents per ton in addition to the above rates.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$5 20	$6 50
" " at S. Amboy	6 00	6 50
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	8 50	..
" Orrel	6 00	6 50
Youghiogheny, Waverly Co., at Balt	5 00	6 50
Despard, West Va.,	....	6 50
Murphy Run, West Va., at Baltimore	4 75	6 50
Fairmount, West Va., " "	4 75	6 50
Newburgh Orrel, Md. " "	4 75	6 50
Cannelton Cannel, W. Va., at Richmond.	9 50	11 00
" Splint, " "	5 00	6 50
Peytona Cannel, " "	9 50	11 50
Straitsville " at Sandusky, O	3 25	10 00

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	10/6@12/9	6 50@7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	47/	18 00@20 00
" Gas Cannel "	30/	12 00
Scotch Gas Cannel, at Glasgow, nominal,	25/ Gold.	7 50
Block House, at Cow Bay, N. S	2 00	5 50
Caledonia, at Port Caledonia	1 75	5 25
Glace Bay, at Glace Bay	1 80	5 50
Lingan, at Lingan Bay	75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75
Steam and House Coals.		
Broad Top, at the mine, $1 25; at Amboy	4 75@5 00	5 25@5 50
Cumberland, at Georgetown and Alexandria, Va	4 00@4 25	....@....
Cumberland, at Baltimore	4 15@4 50	5 75@6 25
Clearfield and Allegheny, "Derby," "Kittanning," "Sterling," "Sonman," and "Eureka," at the mines, $1 25; at Greenwich, Phil.	4 60	5 65

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$6 20	$6 40	$5 60
*Lackawanna coal, delivered	6 75	7 00	6 25
Wilkes-Barre, "	6 75	7 00	6 25
Lehigh & Locust Mountain, del'd	....	....	....
Schuylkill Red Ash, del'd	....	....	....

The Cost of delivering Pittston coal ranges from 40 cts. to $1 per ton, according to distance from the yard.

*Lackawanna grate is quoted 25c. per ton less than egg.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$23 00
Liverpool House Cannel " " "	.... 25 00
American Sterling " " "	.... 13 50
American Orrel " " "	15 00@16 00
Red Bank Cannel " " "	..... 14 00
Cumberland " " "	..... 7 00

Baltimore, Md. July 26, 1875.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$4 86	$4 05
Broken	5 36	5 21
Egg	5 62	5 47
Stove	5 87	5 72
Nut	5 02	4 87
Shamokin. (red or white ash), and "Boston," freeburning white ash,		
Egg	5 65	5 50
Stove	5 85	5 70
Lykens Valley, red ash,		
All sizes	6 05	5 72

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. $6 75@7 75.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point	4 35 4 50
West Virginia f. o. b. at Locust Point	5 50
Youghiogheny Gas, f. o. b. at Locust Point	5 50
Swanton Coal, George's Creek	4 40

Boston. July 26, 1875.

Reported by our Special Correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$5 20	Westmoreland and Penn.	6 85
Caledonia	5 00	Waverly Co. Youghiogh'y.	6 80
Pictou	5 60	Cannelton Cannel	11 60
Block House	5 20	Cumberland	5 80@6 00
Red Bank Cannel	10 00	Anthracite	.6 50@7 25
Glace Bay	5 00	" retail	.7 50@8 00
Sydney	6 25		

The *Shipping List* says: "The market for English, Scotch and American Cannel remains the same, with sales only in retail lots. In Nova Scotia nothing has been done and receipts continue very small. Gas coals remain unchanged. The arrivals have been large and were previously contracted for by the gas companies. Cumberland is quiet and the arrivals are now quite moderate. Anthracite is dull. The retail demand is but moderate and prices range from $7 75@8 25 per ton. Cargo prices are nominally $6 50@7 00 per ton."

The *Commercial Bulletin* of July 24th, says: "Coal is quiet but firm at previous quotations. Freights are now quoted at $1 50@1 60 from Philadelphia and $1 60 @1 75 from Baltimore. The arrivals have been unusually large. Cumberland and gas coals have also been in liberal receipt

"Total receipts for the week—43,259 tons domestic and 1054 foreign, against 25,309 tons domestic and 1316 foreign for the corresponding week last year. Total receipts since Jan. 1, 425,970 tons domestic and 9511 tons foreign, against 491,730 tons domestic and 17,756 tons foreign for the same time in 1873."

Buffalo, N. Y. July 26, 1875.

Reported by our Special Correspondent.

Prices free on board vessels here are as follows:

ANTHRACITE.

	Afloat.	F. O. B. Vessel.	Retail, Deliv'd.
Grate	....	$6 30	$7 00
Egg	....	6 30	7 00
Stove	....	6 75	7 45
Nut	...	6 50	7 20

	Lump.	Run of Mine.	Nut.	Slack.	Nut & Slack.
Connellsville Coke	$5 50	....	....	....	....
Brookfield Coal	....	....	....	....	....
Briar Hill	4 50	....	....	....	3 00
Youghiogheny	4 75	....	....	....	....
Monterey	3 75	3 50	3 25	2 50	....
Catfish	3 75	3 50	3 25	2 50	....
Stoneboro	....	....	3 25	2 50	....
Sterling Cannel	5 50	....	....	....	....
Buffalo Coal Co.	3 50	3 25	....	2 30	....

Chicago, Ill. July 26, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

Retail prices per ton of 2000 lb. delivered to buyer.

No change in prices.

		BITUMINOUS.	
Lehigh Lump	$10 00	Briar Hill and Erie	@ 7 00
Lehigh grate and egg	10 00	Walnut Hill, Pa	@ 6 00
Lehigh stove and chest.	10 50	Midway, Pa	@ 6 00
Lackawanna, Wilkes-Barre and Pittston*		Cannel	@ 9 00
Grate and egg	9 00	Blossburg	8 00
Stove and chestnut	9 50	Indiana Block	5 50
		Hocking "Brooks"	6 00
		Wilmington and Illinois.	4 50

*50 cents off these prices for car load lots to country dealers and manufacturers.

Cincinnati, O. July 26, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	10c.	—
Pomeroy coal	6½c.	—
Cannel coal	16c.	—
Semi Cannel	9½c.	—

The following are the retail prices delivered:

Youghiogheny	— c.	$3 35
Pomeroy	— c.	2 75
Cannel	— c.	5 50
Kanawha Semi Cannel	— c.	3 35
Anthracite		9 50@10
Foundry coke	—	—
Coke, hard and soft	10 c.	—

Cleveland, O. July 26, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb. f. o. b. vessels.

Youghiogheny, lump	$4 40	Columbiana	$3 00
Youghiogheny, nut	3 50	StripVein & Steubenville	3 30
Briar Hill, according to quality	$3 05 to 4 00	Mountain Blossburgh (blacksmith)	5 40
Massillon	3 25	American Cannel Coal Co.'s Cannel	4 40
Hocking Valley	3 35		
Straitsville	3 35		

CLEVELAND, July 27, 1875.

The coal market is now probably the most methodically worked commercial machinery in Cleveland. Supply and demand are so nicely equipoised that business moves like clock-work—without particular animation, but with life enough to guarantee certainty for all leading operations. The mines at all the sources of supply are being worked to a greater or less extent, but none with a view of crowding the product upon the market. The Straitsville coal, which found a large demand here at the time of the Mahoning and Tuscarawas Valley strikes, met with such general favor as to still maintain a fair proportion of the business; and we understand that it is to be shipped as the principal source of supply to the Great Western Railroad in Canada.—*Manufacturing & Trade Review.*

Connellsville, Pa. July 28, 1875.

The shipments over the P. W. and B. Railroad during the last week are slightly in advance of the previous week, but not enough to make any change in prices. Coke is selling on the cars at the yard, at 2¼ to 2½ with sales dull.—*Tribune.*

Detroit, Mich. July 26, 1875.

Specially reported by Messrs. ROBINSON & KEYS, Dealers in all kinds of coal.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep.sizes.	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 50
		Massillon	7 00

Erie, Pa. July 26, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2000 lb.	Bituminous f. o. b.	
Briar Hill lump	$3 75	Beaver lump	$3 50
Midway	3 25	Cat Fish	3 00

Indianapolis, Ind. July 26, 1875.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

IndianCreek, per ton	$2 75	Peytona cannel, per ton.	7 00
White River, "	2 75	Indiana Cannel	0 50
Brazil Block, "	2 65	Hocking Valley	4 25
Highland, grate, "	2 25	Youghiogheny	4 75
Block coal, nut, per car	18 00	Blossburg (smithing)	6 50
Highland " "	18 00	Piedmont "	6 50
Block Slack "	17 00	Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$9 95	Nut	9 80
Egg	9 95	Stove	10 25

Owing to the Miner's strike there is no Lehigh coal in this market.

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	14	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	14	Indiana "	24
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, " "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$10 per ton.
Lehigh, retail	$11 50 per ton.

Louisville, Ky. July 26, 1875.

Specially reported by Messrs. BYRNE & SPEED.

WHOLESALE.

	per bushel		per bushel
Pittsburgh	11c.	Pine Hill	9c.
Raymond City	9c.	Kentucky	9c.

RETAIL.

	per bushel		per bushel
Pittsburgh	14c.	Peytona Cannel	22c.
Raymond City	12c.	Buckeye "	20c.
Pine Hill	12c.	City-made Coke	10c
Kentucky	11c.	Anth., per ton, $10 00 to 10 50	

Milwaukee, Wis. July 26, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.
Retail price per ton of 2000 lb.

Lehigh Lump	$10 00	Scranton	$9 50
Lehigh Prepared	10 50	Briar Hill, select	8 00
Lackawanna	9 50	Blossburgh	8 00
Pittston	9 50	Pittsburgh	7 00

New Orleans, La. July 24, 1875.

Pittsburgh coal, retail, per bbl	65c.
" wholesale	—@45c.
" steamboats, per box	50c.
" to manufacturers, per bbl	60c.
" shipments, per hhd	$6 00
Anthracite, wholesale, per ton	none.
" retail, "	$12 50
Virginia Cannel, per bbl	90c.
Scotch " "	....
St. Bernard, wholesale, per bbl	37½c.
" retail, "	60c.

Pittsburgh, Pa. July 28, 1875.

By our Special Correspondent.

The rise in the rivers has let out some 1,000,000 bushels of Coal for the lower markets, where there was before a good supply.

The output has been very small at the river mines for some time past. Trade at the railroad mines is quite dull, the demand for local consumption and for shipment being light. There is no change in prices of Coal or Coke, and no change in price of mining, except that one or two mines have reduced mining to 2½c. per bushel. No better demand for coal is expected before Fall.

Per ton of 2000 lb. and Bushel of 76 lb.

Youghiogheny coal, ton,	$2 00	Pittsburgh retail deliv'd.	
" coke, "	2 50	per bushel	0@1cc.
Connellsville coal, "	2 50	Anth'cite on cars Lehigh	$7 75
" coke	$2 25@2 75	" " Wilkes-Barre	6 75
Pittsburgh coal	1 85		

Twenty-five to fifty cents per ton additional for delivery.

COAL.—The most important feature we have to record is that there has been a coal boat rise since the date of our last report, and about ten million bushels started for the down river markets; ere this, a large proportion of that consigned to Cincinnati has reached its destination, and by to-morrow the fleet will have reached Louisville. As might be expected the movement of such a large quantity of coal cannot but have a very beneficial influence here; it will furnish employment for the miners, bring back a large amount of money, the most of which will at once be put in circulation, and in many other ways will be of great benefit not only to the trade, but the entire community. It is true, prices are low and the margin for profit small, but this is not confined to the coal business.

COKE.—Trade continues quiet, as it generally is at this season of the year, and no more marked improvement can reasonably be looked for so long as there are so many pig iron furnaces out of blast. Since the date of our last report, a large quantity has been shipped below by river, but business by rail continues light. The rise was of great importance to those dealers who had coke loaded in boats and sold, but who could not move until there was water, as they could not get their pay for it until delivery was made, and this could not be done so long as there was no water. Prices delivered free on cars in Pittsburgh are still quoted at $2 50@2 75 per ton.—*American Manufacturer.*

Richmond, Va. July 26, 1875.

Specially reported by S. H. HAWES, Dealer in Coal.

	per ton.		per ton.
Kanawha Cannel	$12 00	New River Bituminous,	$4 85
" semi-Cannel	4 75	Clover Hill Coal	4 25
Coalburgh Splint	4 90	James River Bitum	3 30
Lewiston "	4 90	" " Carbonite,	5 80

San Francisco.

From the *Commercial Herald* of July 15, 1875.

Imports from January 1st to July 13:

Anthracite tons	6,348	English, tons	23,673
Australian, tons	59,650	Vancouver Island, tons	31,147
Coos Bay, tons	20,000	Rocky Mountain, tons	42
Cumberland, tons	6,539	Seattle, tons	25,966
Mt. Diablo, tons (6 mos)	75,700	Bellingham Bay, tons	6,170

The product of the California Mt. Diablo mines for the past six months, as shown by our statistics herewith, is 7,500 tons less than for a corresponding period of last year and previously. The Coos Bay product has also diminished 9,623 tons, and the Bellingham Bay outturn is 2440 tons less for the same time. The increased supplies for six months past are: from Australia, 14,873 tons; English, 20,683 tons; Seattle, 21,810 tons; Anthracite, 3,322 tons; Cumberland, 1,644 tons. The net increase from all sources of supply for six months, as compared with same period in 1874, is 32,500 tons, and this, taken in connection with the very considerable supplies *en route* from the Australian Colonies, has a depressing effect upon prospective markets, though recent sales of several small cargoes of Wallsend have been effected upon better terms than we expected. Our dealers have found out by long experience that it does not pay to buy and hold coal in yard for a rise. A small profit upon prompt sales is found to be the most profitable. Our store stock of bituminous is said to be large, while that of anthracite is very light, and Lehigh, being very scarce, is retailing at exorbitant prices. Imports for the current week embrace the following cargoes: *Lizzie Williams* from Liverpool, 885 tons; *Mariano*, 600 tons, New South Wales; *Levi Stevens*, 687 tons, same; Seattle, 360 tons by *W. H. Meyer*; 310 tons by *Dreadnought*; 600 tons by *Gem of the Ocean*. Sydney—per *Yosemite*, 1,114 tons. We quote Bellingham Bay at $8 50; Coos Bay, $10; California Mt. Diablo Steam, $6 25@8 25 for fine and coarse respectively. Cargoes of Scotch and English Steam to arrive may be quoted at $9; Cumberland, $18@20; Nanaimo, $9 50@10; Seattle, $9 25@10; Sydney, $9@9 25 by the cargo. The *Royal Edward*, from New Castle, N. S. W., brings 1,800 tons Wallsend. The *Eblana* from same, 1,822 tons, and the *Washington Libby*, 1,500 tons from Departure Bay.

The following gives the comparative imports for the first six months of—

Foreign.	1874. Tons.	1875. Tons.	Increase Tons.	Decrease Tons.
Australian	34,326	49,179	14,873	....
English	1,705	22,688	20,983	....
Vancouver	29,429	29,137	....	292
Eastern.				
Anthracite	3,016	6,348	3,332	....
Cumberland	4,895	6,539	1,644	....
Domestic.				
Mt. Diablo	93,193	75,700	....	17,493
Coos Bay	26,711	18,088	....	8,623
Bellingham Bay	8,610	6,170	....	2,440
Seattle	1,465	23,275	21,810	....
Rocky Mountain	313	42	....	271
Totals	203,643	237,166	62,642	29,119

Our monthly receipts from Mount Diablo mines for a period of years are as follows:

Months.	1871.	1872.	1873.	1874.	1875.
January	9,331	14,671	13,997	15,145	14,181
February	8,832	13,627	10,447	13,589	14,344
March	10,508	16,030	12,178	14,258	12,355
April	9,157	13,062	11,525	15,748	13,732
May	11,457	14,778	14,714	17,287	10,903
June	11,177	13,789	16,606	17,866	10,185
Totals	60,462	85,957	79,377	93,193	75,700

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals, per ton of 2240 lb.

	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J., via Central Railroad of New Jersey	2 56	2 42	2 86	3 18	3 39
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	14	..	56	51	72
‡ Philipsburg, N. J.	97	83	1 34	1 44	1 65
‡ Elizabethp't, Port Johnston, Hoboken and South Amboy, N. J., shipping and wharfage 35c. add.	2 20	2 06	2 80	2 82	3 03
High Bridge, N. J.	2 40	2 20	2 80	2 79	3 09
Somerville and Raritan, N. J	2 80	2 60	3 20	3 19	3 49
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	2 95	2 75	3 35	3 34	3 64
¶ Jersey City, N. J., and New York, via Morris Canal	2 85	2 34	3 17	3 24	3 54
Andover, via Delaware, Lackawanna and Western RR	3 30	3 10	3 70	3 69	3 99
§ Trenton, Somerset Junction and Greensburg, via P. RR. Belvidere Division	2 65	2 45	3 05	3 04	3 34
Trenton, for shipment, including shipping and wharfage	2 11	1 95	2 45	2 46	2 76

From Mauch Chunk to New York (towing limits) and Jersey City† via Lehigh Valley RR. and Morris Canal .. $2 34
From *Lackawanna Junction* to **Auburn, N. Y.*, for shipment, via Southern Central R.R. in connection with Pa. and N. Y. R.R. 2 59
From *Lackawanna Junction* to ‖*Weedsport* for *Rochester and Charlotte* 2 41
From *Lackawanna Junction* to *Sterling* for *Oswego, N.Y.* 2 58
* To this point for Syracuse the rate is 2 06
‖ To this point for all places between Rochester and Buffalo the rate is 2 59
* The rate to this point for Syracuse is 2 22
** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

§ Twenty cents per ton less when five cars at a time to one party. Provided that where the reduction makes the rate $1 a ton, or less, the rate will be $1.

¶ 20 cents per ton additional for transferring coal from boat to boat, and 30 cents per ton for reshipment of same from wharves.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

DELAWARE, LACKAWANNA AND WESTERN RR. Co., (Morris and Essex Division)

From Phillipsburg, N. J. to	Newark	$1 59
" " "	Hoboken, (for shipment)	1 23
" " "	" (for consumption)	1 80

Rules and Regulations.

FIRST.—All claims for lost coal must be made by the shipper. This company will in no case settle claims with the consignee.

SECOND.—All claims for lost lump coal, for which the company may be responsible, will be paid for at the same rate per ton as this company and the iron furnaces in the Lehigh Valley pay for coal for their own use. The allowance for chestnut will be twenty-five cents per ton less, and for stove and egg size, twenty-five cents per ton more than for lump.

THIRD.—Coal will not be paid for if lost from being loaded in broken or defective cars, or in cars with the doors not shut close.

FOURTH.—Consignments less than five 4-wheel cars will be charged twenty-five cents per ton additional upon the above rates.

FIFTH.—Fifteen cents per ton will be charged, in addition to the above rates, for unloading any coal not unloaded by consignee within twenty-four hours after its arrival, except coal unloaded at Newark in the pockets or bins of the company, where ten cents per ton will be charged on all coal to defray the expense of unloading, and twenty-five cents per ton per day demurrage will be charged if not removed within twenty-four hours.

SIXTH.—At Hoboken an additional charge of fifteen cents per ton from cars, and twenty-five cents from stock for shipping expenses, and ten cents per ton for wharfage will be made. Coal delivered in bins for consumption at Hoboken will be charged ten cents per ton additional to consumption rates.

Freights.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore and Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	2 00	....
Albany	*85	1 70	....
Amesbury, Mass	....	....	....
Bangor, Me	†1 35	1 85	1 20
Bath, Me	1 60	1 80	1 30
Baltimore	....	....	....
Boston, Mass	1 60 & 3c.	165–170	1 25
Bridgeport, Ct	....	1 50	80
Bristol, R. I.	....	....	90
Cambridgeport, Mass	1 60&3c.	....	1 25
Derby	....	1 60	....
Dighton	....	1 60	‖1 25
East Cambridge	1 60&3c.	....	....
Fall River	1 35	1 50	90
Hackensack	....	....	....
Hallowell, Me	....	....	....
Hartford	....	....	1 25
Hoboken	†85	1 30	....
Hudson	....	1 60	....
Jersey City	....	1 30	40
Lynn, Mass	†1 60	....	†1 25
Middletown	....	....	1 10
Mystic	....	....	....
Newark	....	....	....
New Bedford	....	1 50	90
Newburyport	....	1 85	1 35
New Haven	*85	1 50	90
New London	....	1 50	85
Newport	1 35	1 50	90
New York	85†	‖1 40	40
Norfolk, Va	75	60	....
Norwalk	....	....	90
Norwich	....	1 65	90
Pawtucket	1 45‡	....	‡100
Philadelphia	....	1 00	....
Portland	1 50	1 75	1 20
Portsmouth, N. H.	1 60	1 85	1 40
Providence	1 35	1 50	90
Petersburg, Va	....	90	....
Portsmouth, Va	....	....	....
Poughkeepsie, N. Y.	....	1 50	....
Richmond, Va	85–90	80	....
Rockport	....	....	....
Saco	....	....	....
Sag Harbor	....	....	1 00
Salem	1 00	1 75	1 25
Salisbury Pt., Mass	....	....	1 50
Savannah, Ga	....	1 50	....
Stamford	*85	....	85
Stonington	....	....	....
Taunton	.. .	..	1 30
Trenton, N. J.	....	....	....
Troy	....	....	....
Warren, R. I.	....	....	90
Washington, D. C.	80	....	....
Wareham	....	1 65	....
Weymouth	....	1 80	....
Wilmington, Del.	....	85	....
Wilmington, N. C.	....	1 50	....

* And discharging and towing,
† And discharging. ‡ And towing.
§ 3c. per bridge extra.
‖ The rate to this point by barge is $1 60.

Freight on Nova Scotia Coals.

Pictou, Nova Scotia, to	New York		$1 75
" " "	Portland, Me		1 90
" " "	Montreal, Canada		2 35
" " "	Quebec, "		180 to 2 00
" " "	Halifax, N. S.		1 25

Pilotage for vessels of from 80 to 150 tons, $6 inward and $4 outward. From 150 to 1000 tons, 10 to $17 inward and $6 to $12 outward. Vessels of 1000 tons and upwards, 2c. per ton inward and 1½c. per ton outward.

Towage 3c. per ton. Trimming 3 hatch vessels, 6c per ton. Two hatch vessels 7c. per ton.

Schuylkill Coals, per ton of 2240 lb.

	From Pine Grove.	From Tamaqua.	From Port Carbon.	From Mount Carbon.	From Schuylkill Haven.
To *Port Richmond*, for shipment, via P. & R. R. R., Main Line	2 12	2 07	2 00	1 99	1 92
Philadelphia, Retail yards	2 22	2 17	2 10	2 09	2 02
Harrisburg, via Lebanon Valley Branch	1 35	2 02	1 95	1 94	1 87
Allentown, via East Pennsylvania Branch	1 70	1 65	1 58	1 57	1 50
Lancaster, and Points on Lancaster Branch, via R. & C. B.R	1 82	1 77	1 70	1 69	1 62
Dauphin, via Schuylkill and Susquehanna Branch	85	....	1 43	1 42	1 35
Slatedale Junction via Berks and Lehigh Branch	1 88	1 83	1 76	1 75	1 68
Lebanon, via Lebanon and Tremont Branch	96	....	....	....	....
From *Tamanend* to *Catawissa*, via Catawissa and Williamsport Branch Railroad					94

From *Tamanend* to *Williamsport*, via Catawissa and Williamsport Branch Railroad..... 1 39
* From *Port Clinton* to *Philadelphia* via Schuylkill Canal, including freight and charges for the use of cars and barges, and for tolls (exclusive of cost of unloading)... 1 69
* From *Port Clinton* to *New York*, within towing limits, " 53d street 2 71

For shipment via Main Road or Schuylkill Canal, one and one-half cents per ton per mile, and two cents per ton additional, to Port Carbon, Mount Carbon, Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for Canal, as the case may be.

Coal sent to points on the Catawissa and Williamsport Branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to Tamanend.

The rates of freight and tolls on lump and steamboat coal will be twenty per cent., and on broken coal will be ten per cent. less than the above rates.

* The charge from Schuylkill Haven to Philadelphia or New York is 11c. additional to these rates.

On and after July 1th, the Drawback of ten cents per ton now paid on shipments of Anthracite Coal from Schuylkill Haven and Port Clinton, that have passed Fairmount Locks to Philadelphia and vicinity, will be discontinued.

Erie Canal.

	per 2240 lb.
Hoboken to Buffalo	75c.
" Rochester	70c.
" Oswego	65c.

The above rates are exclusive of harbor towing, trimming, unloading and tolls.

Delaware and Raritan Canal.

Tolls and Steam Towage.

Per 2240 lb. Cargoes to exceed 110 tons.

From Fairmount to New York, towing limits within 53d st.			69c.
" Greenwich	"	Bituminous	64c.
" Lambertville	"	Anthracite	57c.
" Port Richmond	"	.....	63c.
" "	"	Semi-bituminous coal,	63c.
" Philadelphia	"	Cumberland "	58c.
" Trenton	"	Anthracite "	37c.

CANAL TOLLS, exclusive of towage, Bordentown to New Brunswick, when towed by the Company's Steam Tugs:

For Anthracite Coal.....35c.

Bituminous and Semi-bituminous Coal...35c.

Towing.

From foot of 23d Street, East River, and *return*, *per ton*

	cts.		cts.
Bridgeport, Conn.....	33⅓	New Haven and Norwalk, Conn.....	33⅓
Hartford and Stonington, Conn.....	75	New London, Conn.....	60
Norwich, Conn	68	*Derby, "	33⅓
Stamford, Conn., per boat	$75	Harlem, N. Y., per boat..	$18
Whitestone, L. I.....	$30	Glen Cove, L. I.....	50

	cts.
Manhattanville, via Hudson River, per ton.....	8
Harverstraw and Peekskill, via Hudson River.....	16
West Point and Cold Spring " "	17
Rondout " "	23
Yonkers, boats of 100 tons capacity " " per boat.	$15
Sing Sing and Peekskill " " " "	20

* $10 per boat extra is charged for towage to this point.

Boats having less than 200 tons will be charged the same to Eastern points as if carrying that quantity.

THE BRITISH COAL AND IRON TRADES.

LONDON, July 17, 1875.

There is great depression in the iron business of the several districts; buyers are standing aloof, and stocks are rapidly accumulating. The returns of the Cleveland Ironmasters' Association showed stocks on June 30th of 111,444 tons, or an accumulation, for the month, of 9,953 tons. In the West of Cumberland, prices have been reduced 2s. 6d. per ton on pig iron, which has resulted in several fair orders being placed, it being reported that the Barrow Hæmatite Iron and Steel Company, alone, booked orders, last week, for 6,000 tons. Although Crown Bars have been reduced to £9 (in North) Staffordshire, and the commoner kinds to £8 12s. 6d., and marked bars in South Staffordshire to the basis of £10, and common to £8, yet but little improvement in the demand is observable. There are but very few and unimportant orders being taken for rails either in the North of England or Wales

The coal trade continues to be very quiet. In most of the districts the collieries are only working partial time. The North of England coalmasters are being undersold by the Welsh, on steam coal, by 3s. per ton. Yorkshire complains of a very limited demand, and that the railroad companies do not offer sufficient inducement in transit to the metropolis. Most of the contracts for gas coals are said to be arranged, and it is stated, at very low figures. At Rhymney best steam coal has been reduced in price at the pits, during the week, from 12s. 6d. to 9s. 6d., with one instance of a contract at 9s. A contract has been made for supplying the Admiralty with 80,000 tons of Welsh coal, for delivery at the various arsenals.

The following are the leading quotations of iron:

	Tees, f.o.b.	Barrow, f.o.b.	North Staffordshire, at Works.
No. 1 Pig	57/	*80/6	82/6
No. 2 "	55/	*77/6	
No. 3 "	50/	*75/	80/
No. 4 Forge	48/	75/	77/
Common Bars	160/		...
Rails	140/@147/6		172/6

* Bessemer Pig.

Common bars in South Staffordshire, £8, and marked bars £10; 12/6 extra for Lord Dudley's.

Prices of coal f.o.b. Tyne—Steam 12/6@16; household, 12/@16/; gas, 9/@11/.

THE LABOR MARKET.

At a meeting at Leeds, of representatives of a very large number of miners, Mr. MACDONALD, as chairman, observed that "it was the feeling of the last conference, as he was sure it would be the wish of this, that their meetings were not convened with the view of perpetrating or encouraging strikes. They did not want strikes at all; their sole object in meeting being to bind men together in such a way that their organization would command such respect that their employers would meet them round the same table and settle all disputes without strikes. The present was not the right way of settling disputes; they should be brought to an end upon higher grounds, and with due consideration for the weal of all parties concerned. He hoped the result of the conference would be the framing of such rules as would bind the men together in such a way that strikes would be a thing of the past." A reduction of 4d. per ton has been made at Tufts Level pits Forest of Dean. The notice to reduce the Lancashire colliers' wages 15 per cent has been extended for another fortnight. No settlement has been arrived at relative to puddlers' wages for the North of England. The South Staffordshire ironmasters have resolved to reduce furnacemen's wages 10 per cent.

BOARD OF TRADE RETURNS.

The following items are taken from the Board of Trade returns of exports for the first six months of 1875, as compared with 1874:

	To the United States.		To all Countries.	
	1874. Tons.	1875. Tons.	1874. Tons.	1875. Tons.
Pig Iron	26,760	26,580	319,898	432,599
Bar, Angle, Bolt and Rod	3,193	1,380	114,485	128,388
Railroad of all sorts	64,969	15,734	427,267	259,307
Wire of Iron or Steel, except Telegraph Wire			14,714	21,960
Hoops, Sheets and Plates	2,892	3,313	68,809	94,601
Tin Plates	49,717	52,323	63,534	72,130
Cast or Unwrought Iron, except Ordnance	12,008	4,703	129,652	118,251
Old Iron	3,586	3,783	14,553	8,845
Steel, Unwrought	5,620	5,556	14,247	14,850
Manufactures of Steel			4,561	5,249
Total Iron and Steel	169,645	113,372	1,171.720	1,156,180
Coals Coke, Cinders and Patent Fuel			6,171,526	6,197,209
Coal, etc., for Steamers engaged in Foreign Trade			1,485 325	1,529,216
			7,656,851	7,726,425

As will be observed by the above table, there is but little difference between the amount of exports in the two years. Iron and steel show a falling off, this year, of 15,540 tons, while the coal exports show an increase of 69,574 tons. The exports of iron and steel to the United States show a falling off of 56,273 tons, or one-third. The most noticeable falling off is 49 235 tons, or 75 per cent., in railroad iron, and the greatest increase in any one article is 2,609 tons in tin plates.

THE EBBW VALE COMPANY

have been compelled, for want of profitable orders, to stop their steel works, and it is very uncertain when they will be re started. About 900 hands are thus thrown out of employment.

EVIDENCE BEFORE THE ROYAL COMMISSION APPOINTED TO INQUIRE INTO THE WORKING OF THE WORKSHOP AND FACTORY ACTS.

Mr. WYNNE, the Government Inspector of Mines in North Staffordshire, said that the employment of women on the banks was not objectionable work to them, and it was the common industry of women in the Shropshire and Wigan districts. It is better for them than, and not near so laborious as, field work; it is not unfavorable to morality; it does not make them disorderly or untidy in their houses. He deprecated any interference with this kind of labor, and gave as a reason, that it would have the effect of making iron-stone 7s. per ton more than now, because large wages would have to be given to men to do the work. W EDWARDS, Esq., Mayor of Wolverhampton, a maker of edge-tools, who, owing to provisions of the Act preventing boys under twelve years being employed, is now compelled to pay double what was formerly paid for juvenile labor, said "I argue that it will be of greater advantage to educate the children of this country, and I do not think we shall suffer so much in years to come as we do now." Many objections are made to this act, a prominent one being that, if boys do not enter the pits before 12 years of age, they are likely to be attracted to other trades.

SCOTLAND.

The Glasgow warrant market has been considerably slacker this week, and prices have shown a slight tendency to fall. On Friday, there was a fair business at from 60/ to 60/ 6d., and, on Monday, only a limited number of transactions were effected at about the same rates. Only a single transaction took place on Tuesday forenoon, but in the course of the afternoon upwards of 2,000 tons changed hands at 59/ 9d., fourteen days fixed. Since then there has been very little doing. The prices of the principal makers' brands have, so far, been well maintained, and they exhibit few alterations from those of last week. The quotations are as follows:—G. m. b., at Glasgow, No. 1, 62/; No. 3, 60/ 6d.; Gartsherrie, No. 1, 68/ 6d.; No. 3, 62/ 6d.; Coltness, No. 1, 69/; No. 3, 65/; Summerlee No. 1, 66/ 6d.; No. 3 62/; Langloan, No. 1, 67/; No. 3, 62/; Carnbroe, No. 1, 64/; No. 3, 62/; Monkland, No. 1, 62/; No. 3, 61/; Clyde, No. 1, 64/; No. 3, 61/ 6d; Govan, at Broomielaw, No. 1, 62/ 6d.; No. 3. 61/; Calder, at Port Dundas, No. 1, 68/; No. 3, 62/; Glengarnock, at Ardrossan, No. 1, 67/ 6d.; No. 3, 62/ 6d.; Eglinton, No. 1, 62/; No. 3, 60/: Da mellington, No 1, 61/; No. 3, 59/; Carron, at Grangemouth, No. 1, 67/ 6d.; Shotts, at Leith, No. 1, 68/; No. 3, 64/; Kinneil, at Bo'ness, No. 1, 62/ 6d.; No. 3, 59/ 6d. The shipments of pig iron from Scotch ports for the week ending the 19th inst amounted to 13,215 tons, being 3,863 more than those of the corresponding week of 1874. Since the beginning of the year there is a total increase in these shipments, as compared with the same time last year, of 76,717 tons. The imports of Middlesbrough pigs at Grangemouth for the week were 2,560 tons, showing a decrease of 620, as compared with those of the corresponding week of last year. It is due to the improved pig export trade that the prices of pigs gradually rose in the iron market during the past two months. The exports are about a third larger than they were at this time last year, and it may serve to show the important place they at present hold in the market, to note that as compared with the immediately preceding week, there is a reduction of about 1000 tons, and that this falling off at once gave to the quotations a downward turn. The home consumption of pigs is small, and mostly taken up on contract. No improvement can be reported in the malleable trade, and not a few of the works have difficulty in keeping their machinery moving. Though a number of foreign contracts for pipes held by Glasgow founders are pretty well worked off, still there is a fair amount of work in hand in this department. There is also a good enquiry for ship and boiler plates. The coal trade remains dull, the supplies being much in excess of the demand, and prices are unchanged. The miners make no movement of any kind. Their unions have for the most part fallen to pieces, as the men cannot afford to subscribe the funds requisite for paying agents and keeping the societies together.

W. W. & C. RICHARDSON'S *Monthly Report of Exports of Railway Iron from Great Britain, extracted from Government Returns.*

TO	Month ending June 30.	Six Months ending June 30.		
	1875	1873.	1874.	1875.
	tons.	tons.	tons.	tons.
United States	1,846	120,468	64,969	15,734
Russia	15,033	47,780	74,460	30,927
Turkey	....	552	8,889	28
British India	2,437	8,132	25,026	16,901
British North Amer.	16,410	29,774	28,710	52,790
Egypt	1,282	1,667	10 930	1,474
Australia	5,716	9,193	38,688	42,015
Brazil	31	3,963	11,597	5,159
Holland	1,104	8,241	9,004	3,388
Spain and Canaries.	972	6,548	10,983	6,168
Sweden and Norway.	6,775	15.876	39,968	25,293
Chili	587	2,908	9,183	11,045
Denmark	50	2,808	5,897	2,063
Peru	418	5,467	4,628	11,455
France	6	2,139	1,613	51
Germany	66	24,375	3.297	737
Belgium	17	16,843	12,306	423
Italy	2,192	13 084	10,245	5,338
Other Countries	3,148	27,839	57,461	28,418
Total	58,088	347.757	427,267	259,307
Total Exports from Great Britain of Iron and Steel to all countries	226,584	1,532,067	1,171,720	1,156,180

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, July 30, 1875.

Pig Iron.—We are reported a sale of 3,500 tons of pipe iron, particulars not given. There is another contract for about 7,500 tons about being closed. It is supposed, that the former lot was sold at very low figures, and that the bids now in for the latter, are also low. There are prospects of considerable iron being sold for pipe purposes. Plenty of good No. 1 Lehigh pig iron, has been sold or rather offered at $26 per ton; and it is quite certain that a large lot would not bring that figure. It has been the policy of most makers, to quote high figures expecting, of course, that buyers would insist on concessions, and then granting them as if they were favors. As there has been considerable quiet under-selling, we are given to understand that it is very probable that good No 1 Lehigh iron will be openly quoted at $26, next week Notwithstanding all we have heard relative to the small make, we are informed, on very good authority, that stocks have been accumulating, and although it is said that iron is being made at a loss, yet we learn of furnaces blowing in, or about to blow in. We quote No. 1 foundry, at $26@$27; No. 2, $24@$25; and forge, at $22@$24. Four or five hundred tons of iron have been sold at above quotations.

Scotch Pig.—The business appears to have been confined to lots of less than 100 tons, and aggregating but little. The Glasgow market shows but little change, with an inclination to weakness. We quote nominally at

$29@$30 for Eglinton; and $31@$32 for Coltness and Gartsherrie.

Rails.—We are able to report quite a movement in rails, although it represents a portion of the orders which we have previously reported as being in the market. We note sales as follows: 600 tons of steel for Eastern shipment; 3,500 tons of steel for Western shipment; 450 tons of iron for Eastern shipment, and between 2,000 and 3,000 tons for Southern shipment. Terms are kept private, but we are informed that most of these lots were sold at good prices. A fair business is expected before the closing of navigation. We quote nominally at $48@$50 at the mills, for iron, and $70@$75 for steel.

The Scranton *Times* says:—"It is thought the new steel mill of the Lackawanna Iron and Coal Company will be complete and fully equipped for operations about the beginning of September next."

Old Rails.—We are unable to learn of any transactions, and in the absence of business quote nominally at $26@26 50.

Scrap Iron.—There have been some small transactions on private terms, but hardly worthy of note. We quote at $31@$32.

Spiegeleisen—Containing 10⅛ per cent. of manganese, and 65 thousands of one per cent. of phosphorus, is quoted, to arrive, at $40 gold.

Baltimore. July 28, 1872.

Specially reported by R. C. HOFFMAN & Co.

We have no change to note since last report. The iron market continues dull, and transactions light, at about the following prices:

Baltimore Charcoal	$30@35	Anthracite No. 2	$25@26
Virginia Charcoal	30@35	" No. 1	23@24
Anthracite No. 1	27@28	Mottled and White	20@22

Boston. July 28, 1875

IRON.—We have no movement to report in Scotch pig, and prices are nominally unchanged. The demand for American pig is quite limited, and sales have been only in small lots from store at $30@32 for No. 1, and $28@29 per ton for No. 2. Refined bar iron is in light request, with sales on a basis of $58@59 per ton. Common bar is quiet at $53@54 per ton. Rails are without movement of importance and prices nominally unchanged. Sheet iron is selling in a small way at previous prices.

Imports of pig iron from Jan. 1 to July 24.

	1874.	1875
From Great Britain, tons	2375	1350
Coastwise	6943	8178

LEAD.—There is no change in the market for pig lead. The sales have been confined to small lots of domestic at 6c, gold. Sheet and pipe are still quoted at 9½c.; and block tin pipe at 45c. per lb.

Imports from Jan. 1 to July 24.

	1874.	1875.
Pigs	62,864	21,254

COPPER.—There is no change in prices of manufactures of copper. We quote sheathing at 30c.; bolts and braziers at 31c; yellow metal sheathing at 22c.; and metal bolts at 28c. per lb. Ingot is held firmly at 23c.@23½c. per lb., with small sales. In New York, the sales include 300,000 lb. Lake at 22¾c.@23½c. per lb.

TIN.—Straits are held at 18½c.@18⅝c. per lb., gold, but no sales of consequence to report. The New York *Shipping List* reports a forced sale of 1100 pigs Straits, supposed at 18c, gold.

TIN PLATES.—Trade continues dull and prices weak. We quote currency rates as follows:—Charcoal IC at $10@10 25; coke at $7 75@8 50: and terne, including all kinds, at $7 75@10 75 per box.—*Shipping List.*

The *Commercial Bulletin*, of July 24, says: "Pig has had a quiet week again, although holders talk as though the prices at the furnaces had advanced 50c. per ton. There is no ripple of change to the tone here, which is as it has been for two months, rather nominal, while the best brands are offering in 25 and 50 ton lots at primary points at $27.

"On wharf here, No. 1 $29@31; No. 2, $24@27, and gray forge, $21@24.

"BAR has had a trifling business, just enough to keep the few people about the warehouses, not excursioning, a little busy. The market values are settling closer towards $58, and losing that tone of strength which carried the majority of transactions nearer and nearer towards $60. The reports from abroad that a reduction had been made of £1 per ton in English iron have no effect here, as more than this decline had been discounted here in June.

"Common iron is listless and easy, quoting at $52@56 as to size."

Cincinnati. July 27, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Below we give you closing quotations of our Pig Iron Market, viz:

CHARCOAL.

Hanging Rock, No. 1 Foundry	$26 00@27 00	4 mos
" No 2, "	25 00@26 00	4 mos
" Mill	24 00@25 00	4 mos
Tennessee No. 1, Foundry	26 00@	4 mos
Tennessee, No. 2, "	25 00@	4 mos
" Mill	24 00@25 00	4 mos
Missouri, No. 1, Foundry	@	4 mos

STONE COAL.

Ohio, No. 1, Foundry	24 00@25 00	4 mos
" No. 2, "	23 00@24 00	4 mos
Ohio Mill	23 00@24 00	4 mos
Missiouri, No. 1 Foundry	27 00@28 00	4 mos
" No. 2, "	26 00@27 00	4 mos
" Mill	26 00@27 00	4 mos

CAR-WHEELS.

Hanging Rock, C. B	40 00@50 00	4 mos
Tennessee "	30 00@35 00	4 mos
Missouri "	35 00@38 00	4 mos
Alabama "	30 00@35 00	4 mos

BLOOMS.

Charcoal	70 00@ 80 00	cash

SCRAP IRON.

Cast	65c.@ 90	cash
Wrought	1 00@1 40	cash

Chicago. July 26, 1875.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Our pig iron market remains quiet, the demand being confined to small lots. We quote:

No. 1 Coltness	$41 00@ ....
No. 1 Gartsherrie	40 00@ ....
No. 1 Summerlee	39 00@ ....
No. 1 Glengarnock	38 00@ ....
No. 1 Eglinton	37 00@ ....
Wareer's "American Scotch"	34 00@ ....
Massilon No. 1 Foundry	33 00@ ....
No. 1 Grand Tower Mo. ores (Bituminous)	30 00@ ....
No. 2, " " "	28 00@ ....
No. 1 Mill	26 00@ ....
Union "A" 1 (Anthracite)	28 00@ ....
Union "B" 1 (Anthracite)	27 00@ ....
No. 1 Lake Superior (charcoal)	30 00@ ....
No. 2 Lake Superior "	29 00@ ....
No. 3 Lake Superior "	30 00@ ....
No. 4 Lake Superior "	32 00@ ....
Bessemer Steel Rails	73 00@ ....
New Iron Rails	50 00@ ..
Old Rails	28 00@ ....

Cleveland, Ohio, July 26, 1875.

Specially reported by Messrs. C. E. BINGHAM & Co., dealers in pig iron and iron ore:

FOUNDRY IRON.

No. 1, Lake Superior Charcoal	32 00@....
No. 2, " "	31 50@....
No. 1, Anthracite	29 50@....
No 2, "	27 50@....
No. 1, Bituminous foundry	29 00@ ...
No. 2, " "	27 00@....
American Scotch, No. 1, Cherry Valley	31 00@....
" " B—1, " "	28 50@....
" " No. 2, " "	27 50@....
No. 1, Massilon	30 50@....
B—1, "	27 50@....
No. 2, "	25 50@ ...

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	31 50@....
No. 4 " "	32 50@....
Nos. 5 and 6 " "	33 00@....

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	31 75@....

FORGE IRON.

No. 1, Gray	25 00@....
White and Mottled	23 50@....

THE pig iron market remains unusually dull, with but little hope of immediate improvement. A slight decline has taken place in No. 1 Lake Superior Charcoal, and Nos. 1 and 2 Lake Superior Bessemer. Orders are very light, being just sufficient to cover immediate wants, and inquiries have fallen off materially within a few days. Still there are strong hopes among holders that a more brisk demand will soon be inaugurated.

Bar iron is steady and demand fair at card rates. Sheet, plate and nails are unchanged and in fair request. The general market has a better appearance than it has had for some time past as regards the future, and an early general revival is confidently looked for. All the mills in the city and the Mahoning Valley are reasonably busy, with orders of a good character.—*Manufacturing and Trade Review.*

Louisville. July 26, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is very dull, but without change in price.

Pittsburgh. July 26, 1875.

Specially reported by A. H. CHILDS, Esq., Commission Merchant for the sale of pig iron, blooms, ore, etc.

QUOTATIONS.

No 1. foundry	$27 00@28 00	4 mos
" 2, "	25 00@26 00	4 mos
Gray Forge	24 00@25 00	4 mos
White and mottled	22 00@23 00	4 mos
Hot blast charcoal	28 00@30 00	4 mos
Cold blast charcoal	35 00@40 00	4 mos

July 28, 1875.

PIG IRON.—Trade continues quiet, as it generally is at this season of the year, and the probability is that it will remain so for some weeks yet, as the demand, in consequence of the hot weather, together with the fact that some of the mills are taking an account of stock, is light, confined mainly to supplying immediate necessities. The general outlook, however, as stated in our last review, is favorable to the selling interest, and producers generally are very firm in their views, not a few of them refusing to sell at current rates; it is very generally conceded that the consumption has been considerably in excess of the production ever since the mills were started up after the lock-out, and stocks both in first and second hands are much reduced in consequence. The stock of mill iron here and at those points tributary to this market have not been so much reduced for several years as they are at the present time; there is no doubt about this, and it is this more than all other causes combined, that has silenced the market. It is not expected that there will be any very decided advance, but furnacemen generally are confident of being able to secure an additional dollar or two per ton within the next few weeks, or as soon as the mills commence to stock up for the Fall trade. The fact is, manufacturers, while contending that the raw article is, and has been all this season, higher relatively than the product, very generally concede that pig iron is as low as it is likely to go; and we have reason to believe that there would be no difficulty in placing a considerable amount either for present or future delivery at current rates. Furthermore, there are capitalists with idle capital who are impressed with the belief that pig iron is good property at current rates, that it is a better and safer investment than a great deal of the so-called gilt-edge paper offering; and we should not be surprised if there was some inquiry on speculation before long, as money is easy and good investments are scarce. In addition to the fact that it is believed that the market for pig iron has touched bottom, unlike other articles of merchandise, it requires no insurance, as it bids defiance to both water and fire, and, moreover, it is too heavy to be carried by thieves without detection.

MANUFACTURED IRON.—The general position of the market for manufactured iron remains substantially the same as noted at the date of our last review; business, while it cannot by any means be termed active, is about all it usually is at this particular time, and the mills appear to have about all they can do, working single turn. Our manufacturers, in view of good crops and easy money market, are very hopeful of at least an average trade during the coming Fall and Winter, and there is no good reason apparent at the present writing why their expectations should not be realized. Another point in connection is that stocks, both in the hands of consumers and jobbers, are very much reduced, as they have been adhering closely to the hand-to-mouth policy, buying only as their immediate necessities required, carrying no more stock than they could possibly avoid. Prices are firmer in sympathy with the raw article, but unchanged; we continue to quote at 2 25@2 35 for bars, western classification. It appears to be very generally conceded that hard pan has been reached, and that when there is a change it will be for the better.

Richmond, Va. JULY 26, 1875.

Reported by ASA SNYDER, Esq.

This market remains as at former report. First-class car-wheel irons are well sold up. Inquiry is not as active as for the weeks immediately preceding this, still no large order could be filled from stock in hand. There still remains a considerable stock of new brands which are offered below quotations.

Virginia Cold Blast Charcoal Pig Iron						$30	to $35
" Warm " " " "						28	to 32
" " " Coke " "	1 X					26	to 27
" " " " " "	2 X					25	to 26
" " " " " "	3					24	to 25
" Anthracite	1 X					27	to 29
" "	2 X					26	to 27

St. Louis. July 29, 1875.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

BITUMINOUS.

Missouri, No. 1	$28@29	Massillon A No. 1	$36@37
" " 2	$26@27	" B " 1	$34@36
" " 1 Mill	$25@26	" " 2	$33@34

CHARCOAL—HOT BLAST.

Missouri, No. 1	$28@29	Hanging Rock, No. 3	$26@00
" " 2	$26@27	Tennessee, No. 1	$28@29
" Mill	$25@26	" " 2	$26@27
Hanging Rock, No. 1	$29@00	" Mill	$25@26
" " " 2	$27@00		

CHARCOAL—COLD BLAST.

Missouri Car Wheel	$37@40	Tennessee " "	$35@40
Alabama " "	$35@40	Hanging Rock "	$53@55

MISSOURI BLOOMS AND BILLETS.

Charcoal Blooms	$75@85	Hammered Billets	$90@100
Scrap "	$70@75		

San Francisco, Cal.

From the *Commercial Herald* of July 15th, 1875.

Imports of Pig Iron for the week embrace 100 tons from Bordeaux per *Montmorency*; 200 tons from Liverpool per *Cosma*, and 200 tons same per *Lebu*. Sales are reported of 100 tons Eglington iron. We quote, Eglinton No. 1, at $39@40; Glengarnock No. 1, $42 50@44 for spot parcels, while the same, to arrive next Fall and Winter, can be purchased at $32@33 per ton. Australian Block Tin is plentiful and cheap, so also is Tin Plate. Of the latter, imports this week exceed 4,000 boxes, most of which was sold to arrive upon private terms.

METALS.

NEW YORK, Friday Evening, July 30, 1875.

Gold Coin.—During the week past gold has ranged from 112 to 116¼, and closed to-day at 112¾.

Bullion.—Fine silver bar is quoted at $1 21@$1 22, gold, per ounce, and fine gold bar, par ($20 67 gold per ounce) to ¼ per cent. premium.

Copper.—The sales during the week under review, probably aggregated between 300,000 to 400 000 lb. at 23c., at which figure the market is very firm. Chili bars were quoted in London, on the 28th inst., at £79, showing a falling off of £1 since our last. There is a fair amount of inquiries in this market, and bids are made at 22¾@22⅞c. The position of the copper market appears to be a very good one. The failure of DUNCAN, SHERMAN & Co. and others, earlier in the week, had the effect of momentarily checking business, but it is looking even better now than it did at this time last week.

Messrs. JAMES & SHAKSPEARE, of London under date of July 16, say:—'At the Swansea ticketing, on 13th instant, 857 tons ore, averaging 21 11-16 per cent. produce, fetched an average price of 16/ per unit. Sales of Bars, throughout the week, were but small; the transactions consisting entirely of a few second hand parcels, chiefly the realisation of purchases made three months ago from "bears" at £80 per ton, and which the said parties have been buying back, either at same figure,

or 10/ to 20/ advance thereon. Importers are almost entirely out of the market, and though it would not be easy to realise, in quantities, at the lowest quotation, (£80), yet it is equally difficult to find sellers of large parcels, except at an advance of 20/ to 30/ per ton on the top price, £81 10/, in our list. There is a moderate demand for Australian sorts, at the rates current last week. English descriptions are dull, and sales reported at low figures; but smelters, as a rule, refuse to accept the prices offering."

Tin.—There is a fair jobbing demand, and a good Fall trade is expected. Travellers from the West report indications of a good trade from that quarter. Straits, Refined, and L. & F. are quoted at 18½c., with but very little Refined in the market. Banca is quoted at 23c., although some are asking more. Straits, in London, on the 28th inst., was £77. A cablegram of the same date reported the Singapore market at $21 per picul, with an upward tendency. The average price obtained for Banca, by the Dutch Trading Company, at its sale yesterday, was 48½ florins, equal to £82 10s. in London. Charcoal tin plates are quoted in this market at $8.12½ @$8.25; ternes, $7.37½@$7.50; coke tins, $6.75@$7; and ternes, $6.50@$6.72, prices all gold.

MESSRS. JAMES & SHAKESPEARE, of London, under date of July 16, say: "For English the enquiry keeps slack, and values have fallen in sympathy with other sorts. Foreign descriptions are still much depressed; some of the importers having exhibited an anxiety to sell, values show a further decline of about 2/ per cwt. During the last day or two, however, the tone of the market has been steadier, as present prices have tempted buyers to come forward rather freely, though as yet they refuse to pay any advance on the lowest rates accepted. Tinplates remain very dull, and several makers have again reduced their quotations, in the hope of inducing a demand."

Lead.—The transactions of the week aggregate about 150 tons in lots, mostly at 5·95c. gold. We are unable to learn of anything doing in Foreign, and quote nominally at 6⅝c.@6¾c. gold.

Spelter and Zinc.—There is but little doing in domestic spelter, which appears to be constantly moving at 7¼c. currency, regardless of the combination prices. There is nothing doing in Foreign spelter. Sheet zinc is quiet at 8⅝c.@8¾c gold.

Antimony.—There is a little business doing in a jobbing way at 13¼c.@13¾c. gold.

Quicksilver is quoted at 75c. per lb. in this market, and 70c. in San Francisco. The London market has declined to £10 10/ p-r flask of 75 lb.

The San Francisco *Commercial Herald* of July 15, says:

The demand for the China steamer *Oceanic*, hence for Hongkong the 15th inst., has been the occasion of purchases of several hundred flasks at 67½@70c. per pound. It will be seen by the annexed statistics that our exports by sea for the past six months aggregate 9,655 flasks, valued at $680,764, against 2,453 flasks valued at $236,073 for a corresponding period of last year. Our shipments overland to New York, etc., for the same period, cannot have been less than 500 flasks per month, yet the actual figures are not at present forthcomiug from the Central Pacific Railroad office. No doubt the great decline in price which has taken place within the year has tended to lessen the production and to freeze out several small cinnabar mining companies. A year since, the current price was $1 35, about double the present value. Sales for the week, in lots of 1,000 flasks, at 70c.

The exports per *Oceanic*, hence this day, were 1,443 flasks, valued at $76,237.

Exports by sea for the first six months of—

	1874		1875	
To	Flasks.	Value.	Flasks.	Value.
New York	25	$ 3,000	12	$ 1,423
Mexico	1,692	159,993	2,605	202,050
Chili	404	39,888	355	24,803
New Zealand	31	3,050	25	1,398
Bolivia	134	13,805	....	....
China	100	9,563	4,863	301,639
Japan	56	5,717	306	21,845
Central America	9	850	4	200
British Columbia	2	207	10	536
England	..	....	100	7,650
South America	..	....	1,020	96,516
Australia	..	....	352	21,959
Calcutta	..	....	10	550
Russian Asia	..	....	3	195
Totals	2,453	$236,073	9,665	$680,764

NOTE.—The substitution, by a compositor; of "future gain," for "grain," in our remarks under "Copper" in our last issue, completely changed the sense intended to be conveyed.

FINANCIAL.

New York Stocks.

July 30, 1875.

The New York Stock Market closed yesterday, buoyant, at a slight advance on our last quotations. The feature of the week was the failure of DUNCAN, SHERMAN & Co., on the 27th inst., with liabilities variously estimated at from $5,000,000 to $6,000,000. The feeling at the Stock Exchange for the moment was one of great excitement, and some stocks on the list declined 9 per cent. within thirty minutes, under heavy sales. A reaction rapidly set in, and the recovery was characterized by a sharp revival of confidence. Subsequent events have shown that the suspension of this firm was occasioned by speculative ventures in railroads and cotton principally, and the fact that the effect of their failure exercised so little influence on the general market, is an indication that our business is now being done on so safe a basis that even such a failure as this cannot shake the general confidence in its soundness.

Mariposa stock exhibits quite an advance during the operations of the week under favorable reports from the mine. On July 17, the tunnel was 959 feet long, the heading being in serpentine. It had cut two small veins of gold-bearing quartz, which prove to be feeders of the main lode, a short distance ahead. Sales of this stock have aggregated over 6,000 shares, at an advance of from 9½ to 12½ per share. United N. J. R. R. and Canal Co. was quoted at 129½ at the close bid. The transactions in bonds have been fully up to the average, and in many instances quotations have materially advanced.

QUOTATIONS AND SALES OF STOCKS:

	Highest	Lowest	Closing	Shares
Pennsylvania Coal Co	—	—	267	—
Consolidation Coal Co	49	48	48	306
Spring Mt. Coal Co	—	—	65	—
American Coal Co	—	—	60	—
Maryland Coal Co	—	—	19	—
Cumberland Coal and Iron Co	—	—	116	—
Del., Lack., and West. RR. Co	120⅛	119⅛	119⅛	1008
Morris and Essex RR	—	—	102⅛	20
New Jersey Central RR. Co	110⅜	109¼	110⅛	648
Delaware and Hudson Canal Co	119⅜	119	119⅛	265
Quicksilver Mining Co. pref'd	21⅜	21⅛	21⅜	900
" " " Common	15½	13¾	15⅛	1650
Mariposa Land & Min. Co. various	12¾	9½	12¾	6113
St. Louis & Iron Mountain RR	—	—	18	40
Lehigh & Wilkes-Barre Coal Co	—	—	—	—
Total Shares sold				10250
Sales for the week previous				7454
Decrease				2796

The following are the sales of bonds for the same period:

	Sales		Price	
Ches. & O. R. R. 6s, 1st Mtg.	—		—	@ 38½
" " " coupon on	9,000		39⅛	@ 40
Central RR. of N. J. 1st Mtg. N.	11,000		—	@112½
" " " 1st Cons.	33,000		104⅜	@105
" " " Cons. Convt.	—		—	@103⅝
Am. Dock Imp. Bonds	6,000		99½	@101
Del. and H. C., 1st Mtg. Reg. 1891,	—		—	@110
Del. and Hudson Canal, 7s, 1894,	3,000		107	@107¼
Del., Lack. & W. R. R., 7s, con	6 000		—	@119
" " " " 2d Mtg.	—		—	@111
Morris and Essex, 1st Mtge.	—		—	@111½
" " 2d "	8,000		—	@109¼
" " Construction	5,000		103⅝	@103⅞
St. Louis & Iron Mount'n 1st Mtg.	—		—	@ 91⅜
St. Louis & Iron M'tn, 2d Mtg.	—		—	@ 47
Total Sales	$74,000			

Quotations in the last column, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, July 30, 1875.

The Philadelphia stock market has been fairly active during the week, and closed firm within a fraction of our quotations of the 23d inst. The failure of DUNCAN, SHERMAN & Co., coupled with the rumors of a heavy break in prices at the N. Y. Stock Board, temporarily affected the market, and for a short time some of the principal stocks were slaughtered 31,000 shares of Penn RR. sold during the day at a decline of 1⅝ from the highest point, a sharp recovery then set in, the market closing unsettled at the highest point attained during the day. Bonds are firm with about the average volume of transactions. At auction, on the 27th inst., $26,000 bonds $1000 each, Emaus Iron Co. mortgage coupon, 7s, guaranteed by the P. & RR. Co., sold at 86, $1000 L, V. RR., 1st mortgage 6s at 103¾ $600, L. C. & N. Co., 6s 84 at 101¾, and 66 shares of the Westmoreland Coal Co. at $85 per share. The Diamond Coal Co. announces a dividend of $1 per share, payable on demand.

QUOTATIONS AND SALES OF STOCKS:

	Highest	Lowest	Closing	Shr's
Catawissa RR	—	—	19¾	200
" " Preferred	—	—	43	109
" " New Preferred	—	—	39⅝	10
Huntingdon and B. T. RR.	—	—	7⅛	300
" " " Pref'd.	14	13¾	14	300
Lehigh Valley RR. Co	61¾	61⅛	61¾	487
Little Schuylkill RR	—	—	50	50
Minehill Rr	—	—	54	39
Nesquehoning Valley RR	—	—	56½	30
Northern Central RR.	—	—	29¾	134
North Pennsylvania RR.	—	—	52	—
Pennsylvania RR.	51⅝	50¾	51¾	75275
Reading RR.	55½	54½	55	2672
Delaware Division Canal	—	—	—	—
Lehigh Coal and Nav. Canal	50¾	49¾	50¼	10097
Morris Canal	—	—	51	—
" Preferred	—	—	133	10
Pennsylvania Canal	—	—	—	—
Schuylkill Navigation Canal	—	—	7⅜	34
" " Preferred	15	14¾	14¾	189
Susquehanna Canal	—	—	—	—
Buck Mountain Coal Co	—	—	—	—
Fulton Coal Co	—		—	—
Locust Mountain Coal Co		—	—	—
Westmoreland Coal Co	—	—	85	—
Cambria Iron Co	—	—	—	—
Crane Iron Co	—	—	—	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co	—	—	72	37
Total shares sold				89.973
Sales for the week previous				40,923
Increase				49,050

Closing quotations, in the absence of sales, represent the latest prices bid.

Sales of the various bonds for the period under review have been as follows:

	Sales.	Price	
Catawissa RR., 1st m'tge. conv. '82	$	—	@—
" " chat. " '88	—	—	@—
" " new 7s. 1900	—	—	@107¾
H. and B. T. RR. 1st mortgage, 7s	—	—	@106
" " " 2d " "	—	—	@105
" " " 3d " cons	—	—	@ 55
Lehigh Valley RR. 6s, '98	3,000	—	@103¼
" " " 7s, 1910	2,000	—	@110½
" " " con. mtge. 6s reg	24,000	—	@ 99
North Penna. RR. 2d mtge. 7s, '96	—	—	@107
" " " 1st mtge. 6s, '85	7,500	—	@102
Pennsylvania RR., 1st mtge. 6s, '85	5,000	—	@103¾
" " gen. " reg. 1910	—	—	@100
" " 7s coup	2,000	—	@100
Phil. & Reading RR. 6s, 43 & 44 '80	9,500	101	@101½
" " " 7s, '93	—	—	@109
" " " deb. bonds	—	—	@ 80
" " " G. M. 7s, cou. 1911,	1,000	—	@106½
" " " " reg. 1911,	2,000	—	@107⅛
" " " 6s g. 1911	—	—	@106¾
" " new convertible 7s, '93	5,700	—	@105⅝
Phil. & Reading C. & I. Co. 7s deb. '92	—	—	@ 82
" " " " 7s '92-3	—	—	@—
Lehigh Coal & Nav. Canal, 6s '84	—	—	@102
" " " RR, '97	—	—	@103¼
" " " '77	3,700	—	@ 95½
" " " conv. '82	—	—	@102½
" " " " g. '94	—	—	@105¼
" " " gold, '97	6,000	103½	@103¾
Morris Canal, 1st mtge. 6s, '76	—	—	@100
" " 2d " '76	—	—	@100
" " boat, '85	—	—	@100
Penn. and N. Y. Canal, 7s	7,000	—	@106
Schuyl. Nav. Canal, 1st mtge. 6s, '97	569	—	@ 81¼
" " " 2d " 1907	—	—	@ 81
" " " mtge. 6s c. '95	—	—	@ 78½
" " " 6s Imp. '80	—	—	@ 94
" " " 6s boat and car, 1913,	4,000	—	@ 78
" " " 7s " " 1815,	—	—	@ 92
" " " scrip	5,426	94½	@ 95¼
Susquehanna Canal, 6s '94	—	—	@ 77
Total amount of sales	$88,395		

Gold and Silver Stocks.

SAN FRANCISCO, July 28th, 1875.

We note but a few exceptions to a still further advance of the San Francisco stock list. Some of the stocks, as, for instance, Savage, Chollar & Cons. Virginia, are higher than they have been for several months past. Favorable reports of the condition of the mines are coming in from every direction, and no cessation of the remarkable production of the precious metals is probable before we are in a condition to resume specie payments. Undoubtedly, the successful working of so many mines is due to the strides that are being made in the improvement of mining machinery; the increased experience which mine superintendents and men are acquiring with regard to the peculiarities of the mines, and their economical working, is also a very important element in their development.

The discoveries in the deep workings of the California, Consolidated Virginia and Ophir mines are said to more than verify the extraordinary predictions made by engineers, some months ago, of the extent and richness of the ores. Next month the California will be in condition to commence raising ore at the rate of a million dollars a month The Ophir is now producing about $250,000 a month. The ore body in the Eureka Consolidated silver mine grows strong and rich as development progresses. In the 800-foot level it is reported that ore has been struck which carries several hundred dollars in gold per ton.

The Baltimore Consolidated and the Imperial mines have each levied an assessment of $1 per share delinquent August 3d and July 30th, respectively. The Caledonia Mining Co. has levied an assessment of $3 per share delinquent August 11th.

For the week ending July 11th, the bullion product of the Northern Belle mine was $27,994, which left on hand 530 tons of ore.

The bullion shipments of the silver mines at Belmont, Nevada, since January 1, have been as follows:

Belmont Mine	$904,000
El Dorado Mine	664,000
Monitor Belmont Mining Co	645,000
Combination Mine	332,000
Arizona Mining Co	232,000
Other mines	3,500
	$2,780,500

The annual report of the Savage Silver Mining Company shows the following operations for the past fiscal year:

Cash on hand at last report	$26,324 69	
From assessments	413,225 00	
From overdrafts at bank	98,915 71	
All other sources	2,173 47	
		$540,638 87
Labor	$252,834 25	
Mining supplies, new hoisting works, air compresser, etc	148,169 42	
Expenditures upon joint shaft	20,513 79	
Sundry accounts	119,121 41	
		$540,638 87

The Crown Point and Belcher mines continue to produce 500 tons of ore per day.

The Crusader Mining Co., with a capital of $4.000,000, has recently been organized in San Francisco, to operate mines in Mariposa Co., adjoining the Mariposa Estate. The Bank of California announces a dividend of 6 per cent. equal to $200,000, payable July 17th. The aggregate amount of mining stocks sold by the three San Francisco boards for the first six months of the year amounted to $175,000,000, exclusive of sales on the street. The coinage of the U. S. branch mint at San Francisco, for the first six months of the year, amounted to nearly $14,000,000, the largest sum turned out for any similar period in the history of the mint. There were exported from San Francisco, for the first half year of 1875, over $26,000,000 in treasure. This enormous drain has been met without any perceptible inconvenience to the ordinary requirements of business; and it is certainly a substantial proof of the remarkable resources of the Pacific Coast.

Quotations July 28, 1875.

Sierra Nevada	16	Imperial	10
Union Consolidated	8	Yellow Jacket	89
Mexican	20	Kentuck	16
Ophir	52	Crown Point	33
California	61	Belcher	29
Virginia	329	Overman	74
Best & Belcher	52	Caledonia	24
Gould & Curry	18	Raymond & Ely	47
Savage	127	Meadow Valley	6
Hale and Norcross	47	Eureka Consolidated	56
Chollar Potosi	81	Eureka G. V.	5
Alpha	21	Silver Hill	—

Copper Stocks.

BOSTON, July 29, 1875.

Specially reported by WILSON W. FAY & Co., Bankers and Brokers, Room 7, Traveller Building, 31 State street, Boston, Mass.

	Highest.	Lowest.	—Closing— Bid.	Ask'd
Allouez	13¾ July 29	13 July 24	13	13
Calumet & Hecla	160 July 23	153* July 29	152	153
Copper Falls	.....	.....	.9	10
Dana	.....	.....	.200.	25c.
Duncan Silver	July 22 30c	.18 July 28	.15c.	.25c.
Franklin	13¼ July 23	$13.00 " 27	...	13.00
Mensard	.....	.....	.50	1.00
National	.....	.....	3.00	3.1/8
Petherick	.....	.....	.7	.80
Pewabic	July 22 5.00	.....	4¼	5
Quincy	41¼ July 23	40¼ July 29	....	41
Ridge	6⅞ " "	.....	5¾	6⅞
Rockland	.....	.....	500.	.750.
Superior	.....	.....	150.	.250.

The market has been very dull in mining stocks this week, very few sales being effected. The market closes lower for the entire list. Calumet and Hecla has declined from 160@153, ex. div. at $5; Franklin has declined from 13¼@13 asked; Quincy from 41¼@40¼. Ingot Copper is quoted 22¼@22c., and very quiet.

At a special meeting of the stockholders of the Duncan Silver Mining Co., held Monday, July 26th, an assessment of 50c. per share was levied on the capital stock, payable August 16, 1875. 20,725 shares were represented—18,125 voting for, 2,600 against.

The total amount of refined copper shipped from Portage Lake since the opening of navagation up to July 24, amounts to 5,855 tons, and of mineral there was shipped for the same period 1,256 tons.

Gas Stocks.

NEW YORK, July 30, 1875.

The following quotations of Gas Stocks represent prices which have been bid during the week:

Manhattan Gas Light Co. New York, par 50	297
Metropolitan " " " " 100	157
New York " " " " 100	145
Mutual " " " " 100	102½
Harlem " " " " 50	130
Baltimore " " Baltimore, Md.	190
People's " " "	25⅝
Boston, Mass. " "	770
Chelsea, " " "	130
Cambridge, " " "	132¾
Portland, Me. " "	72
Hartford, Conn " "	40
San Francisco, Cal. " "	98
Williamsburgh " "	140
Northern Liberties Gas Light Co. Philadelphia	29½
Brooklyn " " " par 25	245
Citizens' Gas Co., Brooklyn " 20	150
Nassau " " " " 25	123½
People's " " " " 10	96
Metropolitan " "	100
Westchester Co. Gas Co., N. Y.	100
Louisville, Ky.	127
Cincinnati, Ohio, Gas Light and Coke Co.	208
Halifax, N. S., Gas Light Co., par 40	142

At auction, on the 28th inst., 250 shares of the Manhattan Gas Light Co. sold at from 296 to 297½.

The Taunton Mass. G. L. Co. announces a dividend of 10 per cent. The Charlestown Mass. G. L. Co. has announced a dividend of 5 per cent. The Jamaica Plains Mass. and Burlington, Vt. Gas Light Co's., each have declared a dividend of 4 per cent.

The Dorchester Gas Light Co. has declared $3 per share dividend, payable August 2, 1875. The Salem Gas Light Co. pays $4 per share dividend, July 28, 1875.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. THE ENGINEERING AND MINING JOURNAL, containing the official reports of proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. Blank proposals for membership can be had on application to the Secretary.

IV. The second volume of Transactions has been mailed to all home members and associates not in arrears. Any member who failed to receive his copy will please notify the Secretary promptly. The Institute is not responsible for the loss of the volume in those cases where members have changed their residences and have omitted to inform the Secretary. Volumes I. and II. will be sent, post-paid, to non-members, at five dollars each.

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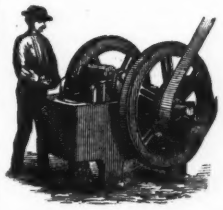

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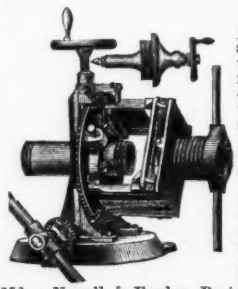

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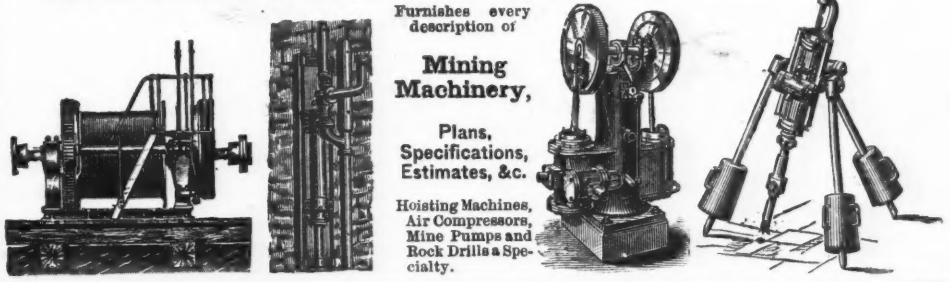

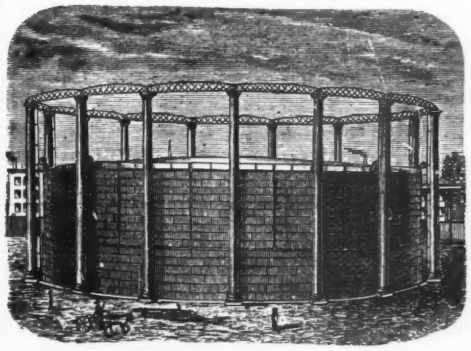

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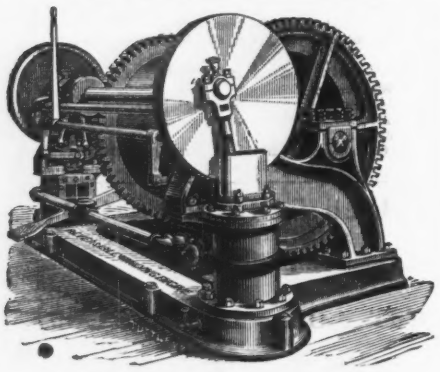

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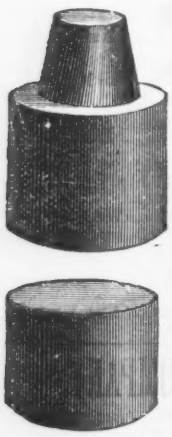

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